EXPO

engineering ▲ design

2024 Capstone Projects

Through a mix of in-person and virtual pathways, thousands across the globe experience engineering and computer science education at the University of Idaho through our annual Engineering Design EXPO.

EXPO is the longest-running student engineering and technological innovation showcase in the Pacific Northwest. The event welcomes K-12 and community college students, industry partners and community members to explore industry-sponsored projects designed by current U of I students in the college's Interdisciplinary Capstone Design Program, ranked top seven in the nation for infusing real-world experiences into engineering education.

Biological Engineering

SHOCK CIRCUIT FOR VIRTUAL FENCE SYSTEM

Ranchers spend valuable resources constructing and maintaining fences to control the grazing boundaries of their cattle operations. As these fences are time consuming and difficult to build, the flexibility of the grazing area is lacking. This harms the landscape and decreases livestock production. There is a need for an adaptable system that can control the grazing area borders. A virtual fence system can be remotely operated, allowing ranchers to easily implement rotational grazing systems.

Team Members
Zachary DeLuca - Electrical Engineering
Abby Fellows - Biological Engineering
Jaycee Johnson - Biological Engineering
Sydney Schoth - Biological Engineering

Client/Sponsor
Dev Shrestha - Department of Chemical and Biological Engineering

Faculty Advisor
Russell Qualls - Department of Chemical and Biological Engineering

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BIOREACTOR SYSTEM TO EXPLORE CELL RESPONSE

Modern medicine has greatly improved our lives, and one hot topic is cell-based treatments. By understanding and using our own cells, we can treat once-untreatable injuries with amazing results. We designed and built a bioreactor that uses fluid flow to apply physical forces to cells to help advance this field.

Team Members
Benjamin Morenas - Biological Engineering
Ishmael Staples - Biological Engineering
Carson Sloan - Computer Science
Carson Rueber - Computer Science
Chris Bui - Computer Science
Zhonghao Guo - Electrical Engineering

Client/Sponsor
Joe Stanley - Stanley Solutions
Nathan Schiele - Department of Chemical and Biological Engineering

Faculty Advisor
Russell Qualls - Department of Chemical and Biological Engineering

University of Idaho
College of Engineering

Civil Engineering

LIBERTY PARK TERRACE APARTMENTS PHASE II

Our project is an expansion to an existing apartment complex in Spokane, Washington. We are providing all the necessary civil engineering design for this project including utility connections, earthwork calculations, stormwater management, site layout, and accessibility requirements. These new buildings will provide more housing for the growing need of the area.

Team Members
Tommy Dittman - Civil Engineering
Gabe Brandt - Civil Engineering
Archie Clark - Civil Engineering
Noah Hattrup - Civil Engineering

Client/Sponsor
Christie Johnson - Coffman Engineers
Avram Sin - Coffman Engineers

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

THE SUMMIT AT 11TH

Our project was to design and analyze a 9-story mixed-use building in downtown Boise, Idaho. The building contains space for residential, retail, office, and restaurant amenities for the local community. The design involved geotechnical and structural engineering elements as well as project management.

Team Members
Mark Slisenko - Civil Engineering
Julian Collins - Civil Engineering
Destiny Hillyard - Civil Engineering
Zhiyuan Xue - Civil Engineering

Client/Sponsor
Lucas Coutinho – KPFF Consulting Engineers
Chaney Wood – KPFF Consulting Engineers

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

ARCADIA LAKE PUMP STATION (CE)

We are helping a city reach the growing water demand by increasing the capacity that the city can provide from a nearby reservoir, Arcadia Lake. This project entails the design of a pump station as well as the pipeline connecting the intake to the water treatment facility.

Team Members
Talia Duke - Civil Engineering
Logan Jeanselme - Civil Engineering
Matthew Troxel - Civil Engineering

Client/Sponsor
Kelby Sommer - Schnabel Engineering

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

REDESIGNING THAIN AND 10TH INTERSECTION IN LEWISTON, IDAHO

The Thain/10th/Warner intersection is located in the middle of Lewiston Orchards. Escalating traffic volumes have led to a rise in vehicle and pedestrian collisions. Using the City of Lewiston's standards, the students comprising STEW Engineering will analyze and redesign the Thain and 10th intersection with the goal of minimizing crashes and delay, improving overall traffic efficiency and safety.

Team Members
Wolfgang Beier - Civil Engineering
Sandra Faulkner - Civil Engineering
Tim Reed - Civil Engineering
Ethan Von Bargen - Civil Engineering

Client/Sponsor
Fred Wismer - Kittelson & Associates, Inc.

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

SNAKE RIVER ROAD IMPROVEMENTS

This project is intended to bring safety improvements, compliance, and accessibility enhancements to Snake River Road in Asotin county, Washington. The existing road is a relatively narrow two-lane paved county road, lacking adequate shoulders or protective guardrails. This project will address suboptimal horizontal and vertical curves, introduce guardrails, and increase the width of the road. The increased width will also increase accessibility for larger vehicles such as RV's and trailers.

Team Members
Julian Blythe - Civil Engineering
Hunter DePriest - Civil Engineering
Olivia Haener - Civil Engineering
Aser Mpoyi - Civil Engineering

Client/Sponsor
Taylor Schwers - CONSOR Engineers
Hannah Long - CONSOR Engineers

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

CROW PUMP DIVERSION

This project focuses on the redesign of a diversion structure and canal to provide fish passage and irrigation water to the Charlo irrigation area near Flathead Lake, Montana. The primary goal of this design is to increase the flexibility, redundancy, and capacity of the pumping station.

Team Members
Kyle Schulz - Civil Engineering
Sadie Sundahl - Civil Engineering
Blaec Dettner - Civil Engineering
Addison Hoffman - Civil Engineering
Andrew Henrikson - Civil Engineering

Client/Sponsor
Jack Krusemark - DOWL

Faculty Advisor
Richard Nielsen - Department of Civil and Environmental Engineering

Chemical Engineering

THE SUSTAINABLE APPLICATION OF A PACIFIC NORTHWEST BIOCHAR OFF-GAS STREAM

Sponsored by C6 Forest to Farm (F2F) in Winthrop WA, the project contributes to their mission of reducing forest fire severity and enhancing forest soil health. The UIdaho-F2F Collaborative engineered a comprehensive application of the off-gas stream from a community-scale biochar production pilot plant. This includes the evaluation of feedstock compositions, identification of marketable components, and a design that separates and purifies additional products from an unused waste stream.

Team Members
Kendall Reeder - Chemical Engineering
Travis Kerr - Chemical Engineering
Ashley Keeley - Chemical Engineering
Kristian Jacobson - Chemical Engineering
Luke Zrodlo - Chemical Engineering

Client/Sponsor
Bret Richmond - C6 Forest to Farm

Faculty Advisor
Matthew Bernards - Department of Chemical and Biological Engineering

ELECTROLYSIS FOR SUSTAINABLE GENERATION

Sodium sulfate is produced as a by-product in several chemical processes, including the water recovery plant at Freeport-McMoRan Inc. (FMI). Sodium sulfate has many applications, but an economically viable product cannot currently be produced by FMI, resulting in their sodium sulfate being transported as waste to a landfill. The WERC team aims to utilize electrolysis to produce and recycle sulfuric acid back to the FMI plant and, in turn, reduce waste production and transportation fees.

Team Members
Destinee Ditton - Chemical Engineering
Aaron Goeckner - Chemical Engineering
Grace James - Chemical Engineering
Nick Knowles - Chemical Engineering
Donald Macdonald - Chemical Engineering

Client/Sponsor
Matthew Bernards - Department of Chemical and Biological Engineering

Faculty Advisor
Matthew Bernards - Department of Chemical and Biological Engineering

GREEN GAS: CONVERTING RENEWABLE ENERGY TO SYNTHETIC NATURAL GAS

Renewable energy sources like wind and solar are an important step toward a sustainable future. Electricity generated from these processes can split water into oxygen and hydrogen. Our project focuses on reacting the hydrogen with carbon dioxide emissions to make methane, which can be used as fuel. This process is known as Power to Gas, and it helps remove greenhouse gases from the atmosphere while creating energy to store and use in the natural gas grid.

Team Members
Chelsea Barrera - Chemical Engineering
Kaylee Janett - Chemical Engineering
Paetra Morgan - Chemical Engineering

Client/Sponsor
American Institute of Chemical Engineers

Faculty Advisor
Matthew Bernards - Department of Chemical and Biological Engineering

Computer Science

MODELING CYBERSECURITY THREATS WITH A FERRIS WHEEL

Cyberattacks on industrial control systems are an increasing threat that can completely shut down access to vital resources like water and gas. The cost and complexity of industrial control systems make it difficult to analyze and research these critical systems. Our goal is to create a small-scale model of an industrial control system that is low-cost, modular, and can be run in a virtual environment to perform cybersecurity-related research.

Team Members
Hunter Squires - Computer Science
Sean Devine - Computer Science
Karina Permann - Computer Science
Matthew Neel - Computer Science
Zherong Qian - Computer Science

Client/Sponsor
Daniel Conte de Leon - Department of Computer Science

Faculty Advisor
Bruce Bolden - Department of Computer Science

SMART PLANK INSPECTION AND NAVIGATION FOR TIMBER EVALUATION AND RECOGNITION

We are developing a system to inspect planks for defects and knots using AI vision. The current problem is the human inspectors cannot keep up with the amount of product coming through the line. The job is tedious and awful. This system should replace the need for so many inspectors which will allow them to be utilized in better positions in the factory saving the company thousands of dollars a year. We are replacing a painful mundane job.

Team Members
James Lasso - Computer Science
Jordan Reed - Computer Science
Dan Blanchette - Computer Science
Brian Healy - Mechanical Engineering

Client/Sponsor
Katie Bradish - Wildwood Grilling
Jason Eddy - Wildwood Grilling

Faculty Advisor
John Shovic - Department of Computer Science

A COMPUTER NETWORK-RELATED GAME FOR EDUCATIONAL PURPOSES

The goal of our project is to create a computer network-related game for educational purposes through Unreal Engine. Our project aims to help more computer networking beginners gain a better understanding of what computer networking is. They can acquire some fundamental knowledge of computer networking while enjoying our project.

Team Members
Jonna Waage - Computer Science
Benqi Zhang - Computer Science
Zheyang Wei - Computer Science
Hongxi Zhu - Computer Science

Client/Sponsor
Daniel Conte de Leon - Department of Computer Science

Faculty Advisor
Bruce Bolden - Department of Computer Science

USING DEEP LEARNING TO PROVIDE FEEDBACK FOR REMOTE PHYSICAL REHABILITATION

When patients incorrectly perform physical therapy exercises their doctor suggests following an injury, their recovery time is extended, leading to financial and physical strain. By adjusting a deep learning model that analyzes videos of clients exercising remotely, we can provide real time feedback potentially resulting in improved rehabilitation outcomes.

Team Members
Molly Meadows - Computer Science
Noah Rieth - Computer Science
Xian Gao - Computer Science

Client/Sponsor
Alex Vakanski - Department of Computer Science
Min Xian - Department of Computer Science

Faculty Advisor
Bruce Bolden - Department of Computer Science

EMPOWERING HEALTH THROUGH DESIGN: ML SOLUTIONS FOR BREAST CANCER EARLY DETECTION

Early detection of breast cancer can reduce mortality rates and expand treatment options. With the growing use of artificial intelligence in the medical field, machine learning approaches for breast cancer detection have met or exceeded human expert performance standards. By designing a machine learning model and integrating it with application programming interfaces, a user-friendly application can detect if images are cancerous or not.

Team Members
Jackson Baldwin - Computer Science
Nyah Nelson - Computer Science
Sihan Wu - Computer Science
Bryan Frahm - Computer Science

Client/Sponsor
Min Xian - Department of Computer Science

Faculty Advisor
Bruce Bolden - Department of Computer Science

GAMIFIED COMPUTERS AND NETWORKS: DEVICES

Our project will be the creation of a gamified cyber security environment tailored for K-12 and university students. The main goal is to facilitate the learning process and solve the problem of the digital gap between a digital twin application and education. In doing so this project will help all by providing a user-friendly and intuitive interface, making learning accessible for all ages. Our project ultimately aims to educate students by enhancing their understanding of cyber security.

Team Members
Oscar Michua-Zarate - Cybersecurity
Cheng Zhao - Computer Science
Fei Teng - Computer Science
Yiqun Wang - Computer Science

Client/Sponsor
Daniel Conte de Leon - Department of Computer Science

Faculty Advisor
Bruce Bolden - Department of Computer Science

INTENSITY-BASED ALIGNMENT OF LASER DEVICES

Our project aims to design, implement, and test embedded software to drive a robotic arm for optical beam alignment. The objective is to have the devices communicate with each other about their location using optical intensity (light based). The devices will then use that to focus a laser signal to each other and align to achieve maximum strength.

Team Members
Dawson Burgess - Computer Science
Marissa Samayoa - Computer Science
Spencer Butler - Computer Science

Client/Sponsor
John Paul Hansen – Hansen Photonics

Faculty Advisor
Bruce Bolden - Department of Computer Science

Electrical and Computer Engineering

THE UNIVERSITY'S FIRST FORAY INTO CUBESAT PAYLOAD DEVELOPMENT

In the past there has been a lot of time between the idea for a space experiment, and the time it takes to go from development to implementation. With the Cube Satellite platform, there is no longer a need to wait so long to go from the idea phase to the delivery phase. Our team will be constructing a payload to attach to a CubeSat that will gather information on radiation in low Earth orbit.

Team Members
Nathan LaVoie - Biological Engineering
Lyna Tran - Mechanical Engineering
Sydney Munson - Mechanical Engineering
Conner Wiench - Computer Science
Dre Mata - Electrical Engineering
Lucien Lee - Computer Science

Client/Sponsor
Avery Brock - NASA Ames Research Center
Malachi Mooney-Rivkin - NASA Ames Research Center

Faculty Advisor
Feng Li - Department of Electrical and Computer Engineering

MAKE HOUSEHOLD POWER MORE EFFICIENT THAN USUAL!

Our project is focused on household electrical system. The main part is the AC to DC transfer system. The benefit of the project is to save more power and improve efficiency in our home.

Team Members
Christopher Pierson - Electrical Engineering
Shihao Bian - Electrical Engineering
Yuncong Zhou - Electrical Engineering

Client/Sponsor
Paul Ortmann - Idaho Power

Faculty Advisor
Kip Sikes - Department of Electrical and Computer Engineering

ARCADIA LAKE PUMP STATION (EE)

Our project is to design a 60 mgd Intake and Pump Station and build the backup generators including full 72-hour capacity, and sub-base fuel storage to handle electrical outages caused by a tornado. This project is to extract water from a lake to satisfy daily requirements.

Team Members
Lingyu Wang - Electrical Engineering
Yujie Xia - Electrical Engineering

Client/Sponsor
John Barrutia - DC Engineering

Faculty Advisor
Kip Sikes - Department of Electrical and Computer Engineering

PORTABLE LED ATHLETICS SCOREBOARD

Our product provides an affordable and enjoyable sports experience for children, fostering life skills like teamwork and perseverance. It eliminates financial barriers by offering fundraising opportunities through in-game advertising.

Team Members
Jenna-Luz Pura - Computer Science
Logan Finley - Computer Science
Paul Martin - Mechanical Engineering
Yuhan Jing - Electrical Engineering
Tingxuan Du - Electrical Engineering
Zoe Stefani - Mechanical Engineering

Client/Sponsor
Reese Shurtliff - Friday Night Flag

Faculty Advisor
Kip Sikes - Department of Electrical and Computer Engineering

Mechanical Engineering

AUTOMATIC END OF ARM TOOL CHANGER

The team is developing a scalable prototype of an automatic tool changer for Bastian Solutions' material handling industrial robotic system. Bastian's inability to switch between every end of arm tool forces them to accept either a small percentage of customer's products or have multiple robotic arms and conveyor lines. Our design of a common interface will allow Bastian to automatically changeover between all tooling, including those previously incompatible.

Team Members
Devin Tanak - Mechanical Engineering
Mohammad Al-Qutub - Mechanical Engineering
Kadin Coddington - Mechanical Engineering
Jason Franklin - Mechanical Engineering

Client/Sponsor
Gabe Riggs - Bastian Solutions

Faculty Advisor
Matthew Swenson - Department of Mechanical Engineering

INL URANIUM, GLASS & DUST SEPARATION

Project creates a way to separate useful uranium fuel from glass and zirconium waste. This improves the efficiency of the fuel cycle for certain new nuclear reactor designs, and creates a way to process existing waste from older reactor designs. End product aids in increasing the viability of nuclear energy as a large scale energy source in the country's near future.

Team Members
Isaac Corgatelli - Mechanical Engineering
Emily Mack - Mechanical Engineering
Joseph Norman - Mechanical Engineering
Ying Yang - Electrical Engineering

Client/Sponsor
Randall Fielding - Idaho National Laboratory

Faculty Advisor
Michael Maughan - Department of Mechanical Engineering

A BURNING PROBLEM - WILDFIRE SMOKE GENERATOR

Across the United States, forest fires are affecting cow's dairy production. Our product will ensure the viability of the 2-billion-dollar dairy industry by allowing the University of Idaho College of Natural Resources and the Idaho Center for Agriculture, Food and the Environment (CAFE) to do groundbreaking research on dairy calves. The project enables them to utilize test chambers to manipulate smoke exposure to run biological tests on calves- determining how smoke inhalation impacts animal performance and health.

Team Members
Kathy Ruiz - Mechanical Engineering
Carter Donnelly - Mechanical Engineering
Derek Walker - Mechanical Engineering
Matthew Etherton - Mechanical Engineering

Client/Sponsor
Amy Skibiel - Department of Animal, Veterinary and Food Sciences
Pedram Rezamand - Department of Animal, Veterinary and Food Sciences

Faculty Advisor
Mark Roll - Department of Mechanical Engineering

SKIN FRICTION RIVET ANALYSIS USING OIL FILM INTERFEROMETRY

We are using the indirect form of measurement called "oil film interferometry" to measure drag presented on the surface of a plane's wing or body. It can tell us the drag due to other objects like rivets or screws without having any live data acquisition equipment touching the test specimen. This is helpful for live data collection on airplanes and can tell companies important information regarding the performance of their aircraft design.

Team Members
Bradley Hille - Mechanical Engineering
Garrett Green - Mechanical Engineering
Jared Nelson - Mechanical Engineering
Hayden Jacobson - Mechanical Engineering

Client/Sponsor
Brandon Stille - Kodiak Aircraft

Faculty Advisor
Paulo Yu - Department of Mechanical Engineering

NO MAINTENANCE BUSHING

An essential part of all mechanical maintenance is regular lubrication. Lubrication, such as grease, can contaminate sensitive workplaces harming food or medical equipment. Additionally, a lack of lubrication can lead to catastrophic failure causing unexpected downtime and costs. Our project will test and validate new alternative bushing materials that aim to eliminate the need for lubrication. This could save an estimated 80,000 gallons of grease yearly.

Team Members
Carlson Wurster - Mechanical Engineering
Jason Jerke - Mechanical Engineering
Casey Lemon - Mechanical Engineering
Ethan Overstreet - Mechanical Engineering
Ben Al Douhani - Mechanical Engineering

Client/Sponsor
Oskar Peterson - Hyster-Yale Group

Faculty Advisor
Matthew Swenson - Department of Mechanical Engineering

SNOWMOBILE TOW-BEHIND ANALYSIS TRAILER

The emphasis on sustainability prompts scrutiny of emissions in recreational transportation like snowmobiles, ATVs, and side-by-sides. Existing tests lack accuracy in field conditions. A tow-behind analyzer is proposed to address this, offering precise emissions measurements. The objective is a device, used by the U of I CSC team, to aid snowmobile emissions research.

Team Members
McKenzie Reid - Mechanical Engineering
Brad Henke - Mechanical Engineering
William Thielman - Mechanical Engineering

Client/Sponsor
University of Idaho Clean Snowmobile Challenge Team

Faculty Advisor
Kamal Kumar - Department of Mechanical Engineering

EMBER GENERATOR FOR FOREST FIRE SIMULATION

Wildfires in the US cost as much as $893 billion per year and buildings at the wild-urban interface are particularly susceptible to wind-carried embers. To better combat forest fires and defend infrastructure, the role these embers play must be better characterized. We designed an ember generator to simulate wildfire conditions and allow for the study of ember propagated fires.

Team Members
Jackson Coleman - Mechanical Engineering
Caleb Hanson - Mechanical Engineering
Aleczander Smart - Mechanical Engineering
Cassidi Shindler - Mechanical Engineering
Peter Wieber - Biological Engineering

Client/Sponsor
Alistair Smith - Department of Earth and Spatial Sciences
Doug Hardman - Department of Earth and Spatial Sciences

Faculty Advisor
Mark Roll - Department of Mechanical Engineering

CONTROLLED VELOCITY PROJECTILE ACCELERATION USING COMPRESSED AIR

Vista Outdoors manufactures defensive ammunition for law enforcement and civilians. Our client faces a challenge with controlling the consistency of their bullet velocity when testing with standard powder cartridges, as velocity is the main factor in how a bullet penetrates and expands upon entry. To reduce the extent of testing currently required to isolate the results from the velocity changes, our design will use a different propulsion system for better consistency in the bullet's velocity.

Team Members
Reed Ofsthun - Mechanical Engineering
Jacob Liedle - Mechanical Engineering
Trenton Gardella - Mechanical Engineering
Aidan Whooley - Mechanical Engineering

Client/Sponsor
Jeff Williams - Vista Outdoor

Faculty Advisor
Mike Maughan - Department of Mechanical Engineering

STEAM PLANT/FISHERIES WASTEWATER RECAPTURE

Our goal is to redirect wastewater from campus Fisheries to the Steam Plant for use in the heating and cooling systems. This conserves water that otherwise needs to be sent for treatment, saving the University money and making better use of our natural resources.

Team Members
Jakayla Wight - Mechanical Engineering
Caden Hall - Mechanical Engineering

Client/Sponsor
Scott Smith - McKinstry
Marc Compton - McKinstry

Faculty Advisor
Paulo Yu - Department of Mechanical Engineering

RELOCATION GUIDANCE SYSTEM FOR C-ARM MEDICAL IMAGING

Most C-Arm X-Ray technology lacks a guidance system that remembers where an image is taken, resulting in surgical inefficiency and excessive radiation doses. This project implements image detection as an affordable guidance system with high accuracy and precision to reduce surgery time and radiation exposure.

Team Members
Hailey Faith - Biological Engineering
Hunter Holbrook - Biological Engineering
Turner Zischka - Mechanical Engineering
Kyle Fiske - Mechanical Engineering
Toby Mclenon - Computer Science
Alphonse Crittenden - Computer Science

Client/Sponsor
Dr. Doug Hiller - Whitman Hospital & Medical Clinics

Faculty Advisor
Paulo Yu - Department of Mechanical Engineering

VERTICALLY OPENING FORKLIFT CAB DOOR WINDOW

Hyster-Yale has tasked us with providing a fully mechanical, vertically opening window for their customers. This consists of redesigning the current cab doors that have horizontally opening windows to improved air flow and visibility. We built and tested a proof-of-concept design for their 3-ton pneumatic lift trucks, which can be scaled to higher and lower capacity models.

Team Members
Cameron Kaminski - Mechanical Engineering
Alex Bailey - Mechanical Engineering
Hunter Higginbotham - Mechanical Engineering
Khaled Alamoudi - Mechanical Engineering

Client/Sponsor
Claire Linneman – Hyster-Yale Group

Faculty Advisor
Mathew Swenson - Department of Mechanical Engineering

DEVELOPMENT OF LOW-COST PROCESS TO CREATE EMI SHIELD

Our goal is to find and create a low cost and low volume process for making a metallic cage to protect an electrical current measuring device from foreign interference. The cage must be within 0.005" of the wall and have at most 1 Ohm of resistance between any two points.

Team Members
Paul Sanchirico - Mechanical Engineering
Khristian Ceballos - Mechanical Engineering
Stephen Wright - Mechanical Engineering
Keaton Hewitt - Mechanical Engineering
Kyle Richmond - Mechanical Engineering

Client/Sponsor
Jonathan Richards - Schweitzer Engineering Laboratories
Alex Olson – Schweitzer Engineering Laboratories

Faculty Advisor
Mark Roll - Department of Mechanical Engineering

AUTOMATED RING ASSEMBLY MACHINE

Our project aims to address the staggering $80 billion annual loss incurred by companies due to workplace injuries, with over 50% of injuries resulting from cumulative trauma. We are developing a prototype to automate repetitive tasks in Nightforce's riflescope ring and mount assembly, enhancing operator comfort, reducing injuries, and boosting manufacturing efficiency for increased daily production.

Team Members
Bryce Hendrickson - Computer Science
Josiah Widmayer - Mechanical Engineering
Lane Pierce - Mechanical Engineering
Luke Presta - Mechanical Engineering

Client/Sponsor
Grant Minor - Nightforce Optics
Jake Elliott - Nightforce Optics

Faculty Advisor
Matthew Swenson - Department of Mechanical Engineering

ROBOTIC ASSEMBLY OF PHOTOVOLTAIC ARRAYS

On the Moon and Mars, there aren't any solar panel factories, but any long-term missions will need a reliable source of solar panels to replace and expand infrastructure. Our project, based on a NASA patent, demonstrates a modular, scalable, accurate, and fully autonomous method of manufacturing solar panels, utilizing robotics.

Team Members
James Adams - Mechanical Engineering
Spenser Scruggs - Mechanical Engineering
Triston Hardcastle Peck - Computer Science
Conner Mullins - Computer Science
Haozhou Su - Electrical Engineering

Client/Sponsor
NASA Idaho Space Grant Consortium

Faculty Advisor
Matthew Swenson - Department of Mechanical Engineering

PRANDTL-D: ADVANCING AUTONOMOUS UAVS FOR WILDFIRE PREVENTION

Over the past year, wildfires surged across our country costing billions of dollars. Our mission is to develop an Unmanned Aerial Vehicle (UAV) equipped with technology to identify potential wildfire 'hot spots.' By utilizing heat sensors, our autonomous UAV locates emerging fires while they are still manageable.

Team Members
Ian Cluff - Mechanical Engineering
Virginia Herbord - Mechanical Engineering
Matthew Weber - Mechanical Engineering
Kyle Hash - Computer Science
Akhil Karri - Computer Science
Yibo Wang - Electrical Engineering

Client/Sponsor
NASA Idaho Space Grant Consortium

Faculty Advisor
Paulo Yu - Department of Mechanical Engineering

HOT CELL WINDOW CLEANING

A viewing window in the Idaho National Laboratory (INL) hot cell has become clouded over on the inside. This is obstructing the view into the cell, making the window nonfunctional. Our team is developing a solution to clean the window using a remote-controlled dry ice blaster to blast the window clean. This project has some unique challenges such as the room being radioactive, and the window having bars in front of it. By making a working remote-controlled window cleaner, INL will be able to use the window again.

Team Members
Levi Bailey - Mechanical Engineering
Owen McDonald - Mechanical Engineering
Andrew Johansen - Mechanical Engineering
Eli Franklin - Mechanical Engineering
Tyler Reighard - Mechanical Engineering

Client/Sponsor
Jesse Kappmeyer - Idaho National Laboratory

Faculty Advisor
Matthew Swenson - Department of Mechanical Engineering