



**SDSU** | College of  
Engineering

# **SENIOR DESIGN DAY '25**

**Wednesday, May 7th 1 - 4 PM**  
**Viejas Arena**



## Welcome to the San Diego State University College of Engineering's Spring 2025 Senior Design Day at Viejas Arena.

We are excited to have you join us as our seniors showcase the innovative projects they have conceived, designed, and built throughout the 2024-25 Academic Year. These capstone projects represent the culmination of their undergraduate experience in the College of Engineering, with participation from our departments of Aerospace Engineering, Civil, Construction & Environmental Engineering, Electrical & Computer Engineering, and Mechanical Engineering.

Congratulations to our student teams on their outstanding work. Their projects reflect the depth of technical knowledge, creativity, and collaboration they've developed during their time at SDSU. This hands-on experience equips them with the skills and confidence needed to address real-world challenges and thrive in their future engineering careers. Through this process, students learn to apply critical thinking, consider human and societal needs, and develop impactful, real-world engineering solutions.

We are also deeply grateful to our generous sponsors - including ASML, City of Long Beach, Clark Construction, Delane Engineering, DIII-D National Fusion Facility, General Atomics Aeronautical, J.R. Filanc Construction Company, Masimo, Michael Baker International, Northrop Grumman, San Diego Zoo Wildlife Alliance, SANDAG, TYLin, Solar Turbines, and the US Coast Guard Aviation Logistics Center - whose support helps make these projects possible.

Many of our sponsors go beyond funding by actively mentoring and guiding student teams. Their partnership is instrumental in our student's success, and we sincerely thank them for investing in the next generation of engineers.

Thank you for being part of this important day. We hope you enjoy SDSU's Spring 2025 College of Engineering Senior Design Day and leave inspired by the creativity and passion of our graduating seniors.

A handwritten signature in black ink that reads "Dr. Eugene Olevsky". The signature is fluid and cursive, with a large, stylized "E" and "O".

**Eugene Olevsky, Ph.D.**  
*Dean and Distinguished Professor*  
*College of Engineering*

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**Mechanical  
Engineering**

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**Student  
Success Fee**

Aerospace Engineering



Geoffrey S. Butler, Lecturer

gbutler@sdsu.edu

Mr. Butler is a working professional aerospace engineer involved in the design and analysis of aircraft for both military and civil applications. He received a BS in Aerospace Engineering from the University of Florida, a MS in Aerospace Engineering from San Diego State University, and a MS in Aerospace Systems from West Coast University. He has over 40 years of experience in the aerospace industry and has contributed to the development of vehicles ranging from cruise missiles, to unmanned aircraft, to hypersonic vehicles, as well as launch vehicles. He is an Associate Fellow of the American Institute and Astronautics (AIAA) and is a member of the AIAA Missile Systems Technical Committee. He has been a lecturer teaching aerospace engineering courses at SDSU including Dynamics, Astrodynamics, Stability and Control, and Aerospace Engineering Applications (AE 460) for over 25 years, and applies a thorough, yet practical, applied engineering approach. He was awarded the AIAA Outstanding Teacher Award in 2015.



Roni Goldshmid, Ph.D., Assistant Professor

rgoldshmid@sdsu.edu

Dr. Goldshmid’s research interests focus on turbulence, thermal fluids, and multiphase flows. Through a synergistic approach combining theoretical analysis, experimental investigations and machine learning, she develops innovative methodologies for predicting, measuring, and controlling fluid flow behavior. This research has direct applications in aerospace engineering, including the design of more efficient and sustainable aircraft, as well as in emerging fields like aerial firefighting technology.



Joseph Katz, Ph.D., Professor

jkatz@sdsu.edu

Dr. Katz has a wide variety of research interests in the following areas: internal combustion engines: cooling, carburation; powerplant optimization; passenger car safety; two phase flow cooling; heat transfer and heat exchangers; wind tunnel measurements, including laser doppler anemometry in two phase flows; non-conventional naval propulsion e.g.: undulating propellers, swimming fins; non-steady aero and hydrodynamics; potential flow and general fluid dynamics; general aviation piston engine cooling and drag reduction; post-stall-spin aerodynamics; automotive aerodynamics and dynamics; lifting body airplane; transonic wings; and stall resistant configurations.



Pablo Machuca, Ph.D., Assistant Professor

pmachuca@sdsu.edu

Dr. Machuca's research interests lie in the field of (deep-) space exploration, involving areas like astrodynamics, trajectory design, (autonomous) guidance, navigation and control (GNC), spacecraft attitude dynamics, (small-spacecraft) mission design and analysis, and systems design. Research topics include Earth-orbiting missions and space debris modeling, cislunar space exploration (Earth-Moon region), small-body exploration (asteroids and comets), and planetary exploration. Current research efforts focus on cislunar optical navigation, uncertainty propagation in cislunar space, robust, autonomous cislunar guidance, asteroid gravitational modeling, autonomous attitude determination and control for comet fly-by missions, and small-spacecraft systems design and mission analysis.

## Civil, Construction & Environmental Engineering



**Mark Filanc, PE, Lecturer**

*[mfilanc@filanc.com](mailto:mfilanc@filanc.com)*

Mr. Filanc is the CEO of J.R. Filanc Construction Company Inc. and has over 40 years of experience in water/wastewater design and construction, as well as extensive expertise in all areas of project management. He is a registered professional engineer in the State of California and has been designated as a Design-Build Professional in Design-Build Institute of America's (DBIA) charter group for lifetime experience. He is the past chairman and current member of DBIA's Water Committee, past President of the San Diego Chapter of Associated General Contractors (AGC), and an instructor at the national level for AGC's Supervisory Training Program. Mark also serves on the SDSU College of Engineering Dean's Advisory Board and the Department of CCEE Industry Advisory Board. Mark holds a Bachelor of Science degree in Environmental Engineering/Water from California Polytechnic State University, San Luis Obispo, and a Master of Science degree in Civil Engineering, specializing in Construction Management, from Stanford University.



**James R. Haughey, PE, MBA, LEED AP, ENV SP, Lecturer**

*[jrhaughey@mbakerintl.com](mailto:jrhaughey@mbakerintl.com)*

Mr. Haughey is Vice President with Michael Baker International in San Diego, California. Jim has over 30 years of experience in Design-Build with an emphasis in public social infrastructure, military engineering, healthcare, aviation, and school development. Jim has a BS in Civil Engineering (BSCE) from San Diego State University and has an MBA from the University of Phoenix. Jim is a Past President of APWA and serves on several industry boards including Society of American Military Engineers (SAME), ACE Mentorship San Diego, Design Build Institute of America (DBIA), SDSU College of Engineering Dean's Advisory Board, and Chair of SDSU Civil, Construction and Environmental Engineering Industry Advisory Board.



**Paul Jackson, DBIA, Lecturer**

*[pjackson@sdsu.edu](mailto:pjackson@sdsu.edu)*

Mr. Jackson is a Program Manager in SDSU's Planning, Design, and Construction Department and has spent the last 6 years focused on SDSU's Mission Valley development including construction of Snapdragon Stadium and the Mission Valley River Park project. Paul has over 20 years in the construction industry beginning in the construction trades and spent 12 years as a construction manager for a local General Contractor. In addition to the projects in Mission Valley, Paul has been involved with dozens of projects at SDSU including Tenochca Hall Renovation, Maya & Olmeca Renovations, various elevator modernization projects throughout campus, and classroom projects on the main campus and at the Calxico campus. As a Design Build professional from the Design Build Institute of America, Paul has managed Design Build and Integrated Project Delivery construction projects for complex hospital projects, kitchen, student housing, sports venues, creek restoration, and site development projects. He is actively working on the next phase of development in Mission Valley including Fenton Parkway Bridge and collaboration with developers for the upcoming P3 residential and innovation district projects. He has been guest lecturing for students at SDSU and local high schools for years and is honored to lead the next generation of Construction Management professionals through the CM Capstone Course. The future of construction management looks bright in the hands of these talented and hard working SDSU graduates!



**Jeremy LaHaye, Principal Bridge Engineer**

*jeremy.lahaye@tylin.com*

Mr LaHaye is a Principal Bridge Engineer with over 25 years of experience. Fueled by a passion for bridges, he has worked for 20 years at TYLin on a wide array of projects and roles. Jeremy has served on design teams for landmark cable stay bridges such as the Port Mann Bridge in British Columbia and lead teams in the design of signature pedestrian bridges including the San Elijo Lagoon Hanging Pedestrian Bridge. Over the course of his career, he has spent time in structure construction inspection, detailed design of Caltrans bridges and iconic bridges internationally, specifically the Lusail Pedestrian Bridges in Doha Qatar. He is known as a dedicated, hands-on project manager with a focus on client satisfaction. Jeremy serves as a TYLin Technical Committee Lead for project specification development and contributes to TYLin’s Bridges to Prosperity program. He was part of the 2023 team building a bridge for the Bishenge community in Rwanda. Jeremy dedicates time as the San Diego State University Civil Engineering Industry Advisory Board Vice Chair and is also a part time lecturer at San Diego State University.



**John Prince, PE(CA/UT), QSD, Lecturer**

*jprince@delanegroup.com*

Mr. Prince is Co-Owner/Vice President of DELANE Engineering with over 24 years of Site Civil Engineering and Site BIM Experience. John has been teaching at SDSU for over 13 years with 2 classes; Intro to Civil and Senior Design, and also serves on the CCEE Industry Advisory Board. John’s initial goal and continued passion for teaching at SDSU is to enhance the industry involvement, helping bridge the gap between academia and profession and prepare students for their careers. John is an alumnus of SDSU where he met his wife (also a Civil Engineer). They have two children (both girls) who are very active skiers and enjoy the mountains.

## Electrical & Computer Engineering



**Barry L. Dorr, PE, Lecturer**

*bdorr@sdsu.edu*

Mr. Dorr is a full-time lecturer in SDSU’s Department of Electrical and Computer Engineering. Prior to that he worked for San Diego electronics companies for 35 years as a design engineer and project manager. Between 1995 and 2006 he owned a small product development firm creating digital radios, control systems and audio systems for local manufacturers. He holds eight patents for various communication, control, and calibration systems. Professor Dorr earned a Bachelor of Science in Electrical Engineering from California State Polytechnic University, San Luis Obispo and a Master of Science in Electrical Engineering from SDSU. He is a registered Professional Engineer in the State of California. Professor Dorr’s Senior Design course (EE/COMPE 491/492) emphasizes practical applications of the fundamentals taught in the ECE curriculum completed within a framework of industry-standard project management practices and personal/team ethics.

## Mechanical Engineering

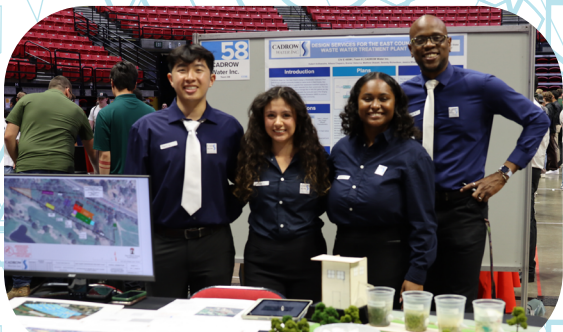


**Scott Shaffar, Ph.D., Lecturer**

*sshaffar@sdsu.edu*

Dr. Shaffar is responsible for the development and implementation of the San Diego State University Mechanical Engineering Senior Design Capstone program including course content and program management through all phases from project definition to final system demonstration. This program includes project management, system engineering, research, ideation, detailed design, engineering analysis, fabrication, assembly, test, and customer delivery. Previously, Dr. Shaffar retired from Northrop Grumman Corporation after a 34-year career. In his assignment at retirement, Dr. Shaffar served as a senior director for Northrop Grumman Aerospace Systems, a premier provider of manned and unmanned aircraft, space systems and advanced technologies critical to our nation’s security. Dr. Shaffar earned a Bachelor of Science in Aerospace Engineering from the California State Polytechnic University, Pomona, and a Master’s and Doctorate in mechanical and aerospace engineering from the University of California at Irvine. He is a member of the American Society of Quality, Society of Automotive Engineering, and the American Society of Mechanical Engineers.





## Give today to the College of Engineering to support our continued success.

Your generous donor support helps to champion the continued success and growth of the College. The College of Engineering is grateful for all those who provide philanthropic support!

If you are interested in supporting the College of Engineering contact Kate Carinder, Senior Director of Development at [kcarinder@sdsu.edu](mailto:kcarinder@sdsu.edu).

The Campanile Foundation | Tax ID 33-0868418

For more information

on donating visit: [campaign.sdsu.edu/engineeringfund](https://campaign.sdsu.edu/engineeringfund) or scan QR code:





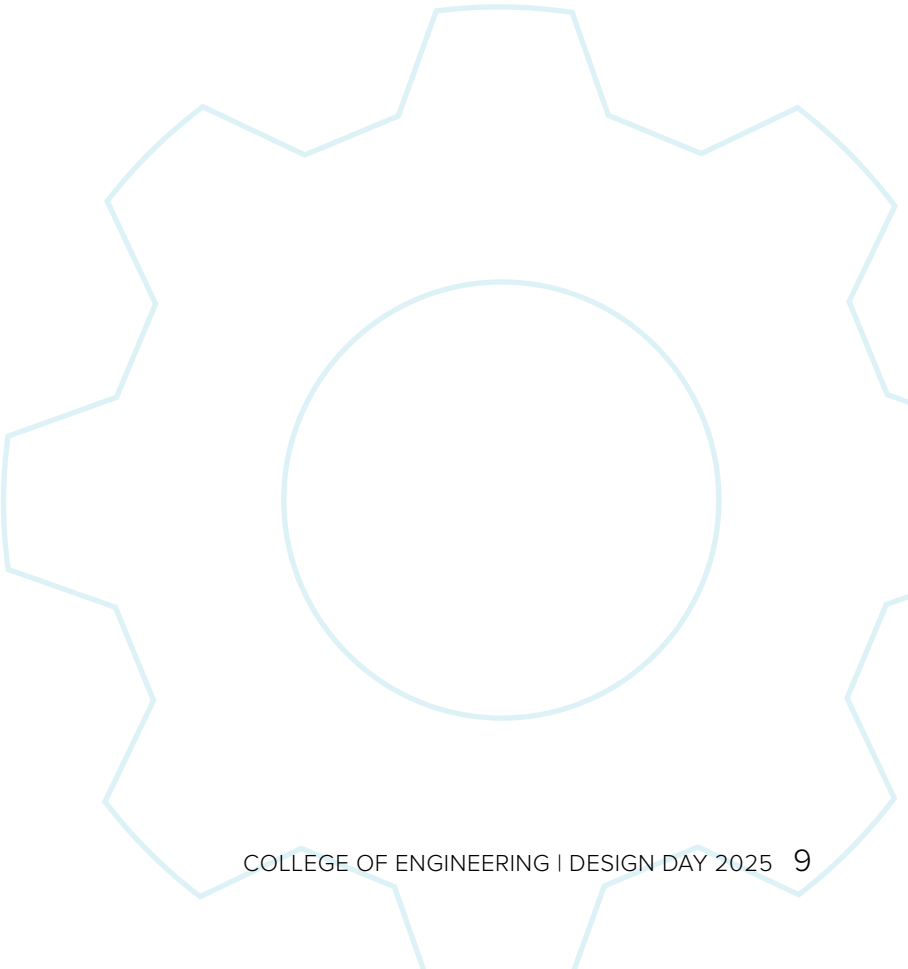


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- The High Ground - *Innovative Close Air Support*
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- Throttling Injector - *Throttling Injector*  
*Sponsored by SDSU Rocket Project*
- USCG Hoist Control Systems - *Mitigating Hoist Load Spin Induced by Helicopter Rotor Wash*  
*Sponsored by USCG Aviation Logistics Center*

Civil, Construction & Environmental Engineering	20
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- AMES Inc. (Team 14) - *UCSD Jacobs Medical Center Tower 2*
- Apex Construction, Inc. - *SDSU Mission Valley River Park*  
*Sponsored by Clark Construction*
- AquaFlow Engineering (Team 3) - *Encinitas Community Park Stormwater Capture and Reuse*
- AquaTerra Engineering (Team 11) - *Pump Station D Outfall Design and Environmental Permitting*  
*Sponsored by Stantec Consulting Inc.*
- Bobby and The Builders (Team 21) - *Vista Inland Rail Bike Trail*  
*Sponsored by QIC and SANDAG*
- Build Masters Construction (Team 10) - *SDSU North Life Sciences Retaining Wall and Foundations Project*  
*Sponsored by Group Delta and Hensel Phelps*
- Coast to Tap Engineering (Team 2) - *South Coast Water Desalination Pretreatment*  
*Sponsored by Filanc*
- Finjan Construction - *Snapdragon Stadium*  
*Sponsored by Clark Construction*
- Founders Four Construction - *Sharp Chula Vista Medical Office Building*  
*Sponsored by Pacific Building Group*
- Hydrocivils (Team 5) - *The Wanket Reservoir Rehabilitation Project*  
*Sponsored by San Elijo Joint Powers Authority(SEJPA)*
- K-SHAM Engineers (Team 19) - *Vista Inland Rail Bike Trail*  
*Sponsored by QIC and SANDAG*
- Kings Engineering (Team 16) - *Newhall Bike Path - Retaining Wall*

Civil, Construction & Environmental Engineering (cont.)

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- LGCN Builders - **Snapdragon Stadium**  
*Sponsored by Clark Construction*
- Medal Engineering Consultants (Team 9) - **SDSU North Life Sciences (NLS) Retaining Wall & Foundations**  
*Sponsored by Group Delta and Hensel Phelps*
- MedBuild Construction LLC. - **Chula Vista Sharp Medical Office Building**  
*Sponsored by Pacific Building Group*
- MediPro Builders - **5451 Medical Office Building Clinic**  
*Sponsored by Align Builders*
- MSRD Construction Firm - **SDSU Mission Valley River Park**  
*Sponsored by Clark Construction*
- Nexgen Civil Engineering (Team 20) - **Vista Inland Rail Bike Trail**  
*Sponsored by QIC and SANDAG*
- RAD PL Enterprises (Team 17) - **Walnut & 5th Avenue Mixed Use Development**  
*Sponsored by KPFF Consulting Engineers*
- Reinforced Divas Engineering (Team 13) - **UCSD Jacobs Medical Center Tower 2**
- Salt-Free Solutions (Team 1) - **South Coast Water Desalination Pretreatment**  
*Sponsored by Filanc*
- Storm Guard Engineering (Team 12) - **Pump Station D Outfall Design and Environmental Permitting**  
*Sponsored by Stantec Consulting Inc.*
- StormGuard Engineering (Team 4) - **Encinitas Community Park Stormwater Capture and Reuse**
- Stormworks (Team 6) - **San Vicente Pumped Storage (SVPS) Project**  
*Sponsored by Black & Veatch*
- Streamline Engineering Solutions (Team 7) - **San Vicente Pumped Storage (SVPS)**  
*Sponsored by Black & Veatch*
- TECCSS Engineering (Team 18) - **Walnut & 5th Avenue Mixed Use Development**  
*Sponsored by KPFF Consulting Engineers*
- TOMRAK Engineering (Team 8) - **SDSU North Life Sciences (NLS) Retaining Wall & Foundations**  
*Sponsored by Group Delta and Hensel Phelps*
- Transit-Soil Engineering Partners (Team 15) - **Newhall Bike Path Retaining Wall**

## Electrical & Computer Engineering

30

aztEQ - **aztEQ: Digital Microphone Equalizer**

HANDS-EMG - **HANDS-EMG**

S.D. Cables - **SHORT-BREAK DETECTOR**

*Sponsored by Masimo Corporation*

Team 12 - Noise Canceler - **Audio Frequency Display**

Team 15 - Handheld Game Device - **Handheld Gaming Device**

Team 4 BMS Project - **Battery Management System for V2G Charging**

*Sponsored by Southern California Energy Innovation Network*

Team ASV - **Audio Spectrum Visualizer**

Team Ate - **L.E.D Piano**

The Flow Stoppers - **Water Leak and Humidity Detection System**

W.A.S - **Wattage Analysis System**

## Electrical & Computer and Mechanical Engineering

34

Aztec Microwire Welding - **Microwire Welder**

C.R.E.E.D. - Propulsion Team - **Nasa Lunabotics - Propulsion**

*Sponsored by SDSU Student Success Fee*

Palm Patrol - **Robotic Palm Trimmer End Effector Design**

*Sponsored by Max Engineering*

Palm Patrol - **Robotic Palm Elevator**

*Sponsored by Max Engineering*

SceneSafe - **Gas Sensor Integrated Elastomeric Half Mask Respirator for First Responders**

*Sponsored by AtmoSense*

S.T.O.R.K. (Specialized Transport & Observation Remote Kopter) - **CSU – California Unmanned Aerial Systems Competition (C-UASC)**

*Sponsored by SDSU Student Success Fee*

The Herd - **Elephant Behavior Monitoring Collar**

*Sponsored by San Diego Zoo Wildlife Alliance*

## Mechanical and Aerospace Engineering

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ASTELAR - **ORION - Orbital Restoration through Innovative Operations Network**

## Mechanical Engineering

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A.S.H.E.S. - **Ember Generator for Fire Research**

ACTUS - **Electric Actuation for Retractable Landing Gear System**

*Sponsored by Northrop Grumman*

Amped-Up - **Electrical Quick Connect Validation Tool**

*Sponsored by Solar Turbines*

ARMOR - **DIII-D Vessel Armor System**

*Sponsored by General Atomics — DIII-National Fusion Facility*

Automaton - **Surface Preparation Utilizing the D-III D Robot System**

*Sponsored by General Atomics — DIII-National Fusion Facility*

Aztec Ergonomics - **Ergonomics Jig (Phase II)**

*Sponsored by SDSU Aztec Electric Racing*

Aztech Prime - **Humanoid Robotics for Social and Emotional Interactions**

*Sponsored by James Silberrad Brown Center for Artificial Intelligence (SDSU)*

BubbleStream - **Laminar Water Jet with Microbubbles**

*Sponsored by Fluidra*

C.R.E.E.D. - Excavation and Deposition - **NASA Lunabotics - Regolith Handling**

*Sponsored by SDSU Student Success Fee*

Mechanical Engineering (cont.)

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C.R.O.M.E (Cell Rejuvenation Output Micro Element) - **High Throughput Platform for Culturing Cells in a Low Volume, 3D Micro-Environment**

Sponsored by Altos Labs

Cerberus - **MQ-9A Remotely Piloted Aircraft Radome Redesign**

Sponsored by General Atomics — Aeronautical Systems

Deep Purple - **EUV Source Module Metrology Tool**

Sponsored by ASML

Dice Heroes - **Dice Roller for Disabled Veterans**

Sponsored by Quality of Life Plus

Dispensable ME - **Dispensing Test Station**

Sponsored by Becton and Dickinson

LiON Power - **Rational Design of Bipolar Stacking Li-O2 Batteries with Ultrahigh Energy Density for Aviation Applications**

Mach-3D - **California 3D Printed Aircraft Competition (C-3DPAC)**

Sponsored by SDSU Student Success Fee

MINOTORR - **Manufacturing of Initiative Chemical Vapor Deposition (iCVD) Reactor for Manufacturing Functional Polymers**

PulsePak - **Sustainable Packaging Redesign for Intravascular Cardiac Medical Devices**

Sponsored by Philips

Sinter Spin - **Rotational Sintering Furnace**

Sprout - **Micro-Environment Management System**

Sponsored by Alan Reyes

Team COMET - **Assembly of oCVD Reactor for Conducting Polymers**

Sponsored by AMED Lab

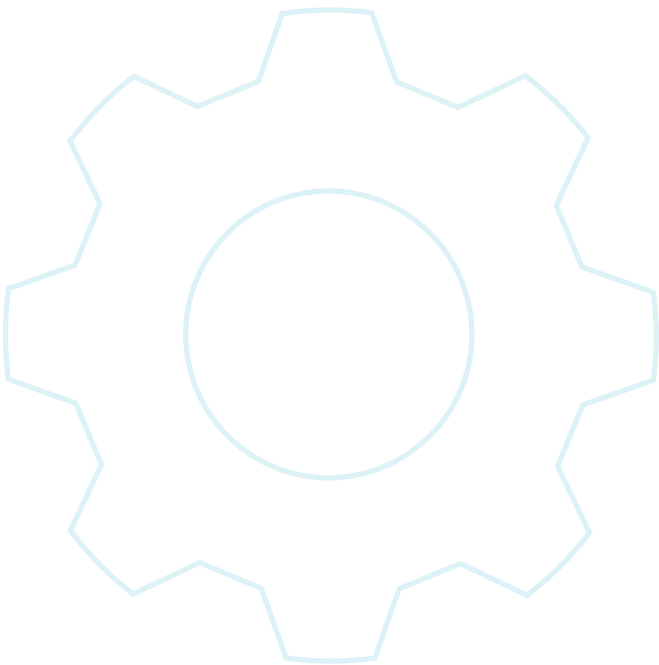
Team FISH (Fishing Innovations for Service Heroes) - **Handheld Fishing Launcher for Disabled Veterans**

Sponsored by Quality of Life Plus

Team STORM - **Semi-Active Long Travel Suspension for Off-Road Racing**

Sponsored by SDSU Aztec Baja Racing

Tec-Tenna - **Recreational Vehicle Conforming TV Antenna**





# AEROSPACE ENGINEERING

## Aerospace Homeland Defense



**MEMBERS**

- Hanna Fakhouri

Robert Graham

Bryce Leon

Chloe Mahiai
- Dylan Ramsay

Mitchell Surrey

Ethan Trieu

**ADVISORS**

- SDSU**
- Geoffrey Butler

**THE HOMELANDER INTERCEPTOR**

A high-performance, low weight, and cost-effective Homeland Defense Interceptor (HDI) that fulfills defense missions of different profiles provided by the AIAA undergraduate team design competition. With a cap of \$25 million per unit, the aircraft will perform various roles including intercepting threats and escorting missions.

## ARCS - Amateur Rocketry Control System



**MEMBERS**

- Sebastian Gonzalez
- Kiril Yampolsky
- Kyle Huynh
- Santiago Ulloa
- Daniel Green

**ADVISORS**

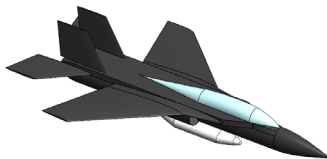
- SDSU**
- Dr. Roni Goldshmid

**ARCS - AMATEUR ROCKETRY CONTROL SYSTEM**

Develop and demonstrate a low-cost, lightweight, and reliable Reaction Control System (RCS) prototype for amateur rocketry teams. By leveraging COTS hardware and minimal custom components, the system will integrate fluid, structural, avionics, and control subsystems to achieve effective attitude control. We aim to significantly lower the barrier for advanced rocket stabilization and maneuverability in the amateur rocketry community.



## Arthropod Aeronautics



**MEMBERS**

- Sean Gidley

Magnus Ramsey

Layla Spangle

Carlos Martinez
- Erica Espiritu

Bryan Ramirez

Jenna Schrady

**ADVISORS**

- SDSU**
- Geoffrey Butler

**ANOMALOCARIS**

Advanced pilot trainer (ATP Jet trainer) designed to replace the T-7 Talon to help train future pilots using a more efficient and better performing aircraft. Anomalocaris will be within the same price range of the T-7, while providing better overall performance for pilots to fly in and train. While adhering to the general guidelines provided by the system requirement documents for an ATP, Anomalocaris was designed with the intent to include configurations to help induce real life scenarios to help train pilots for the potential environments that they would fly in.

C.A.S.P.E.R Lunar Mission



MEMBERS

Jose Reyes  
Sebastian Gonzalez  
Kyle Enriquez  
Ruby Cave  
Sean Brucker

Alec Delgado  
CJ Flores  
Noah Noxon

ADVISORS

SDSU  
Dr. Pablo Machuca

C.A.S - PI ROVER

The project designs a lunar mission using a rover to collect and store lunar ice to further deep space exploration. A rover prototype will also be built to accomplish demonstrative lunar objective missions. The rover will display maneuverability around and over obstacles, will be remotely controlled and navigated using a camera, and display drilling and storage mechanisms to collect sample data.

Youtube Video: <https://www.youtube.com/watch?v=yYdy9coH9CA>

Poster: [https://aerospace.sdsu.edu/design-day/files/2025/casper\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/casper_poster.pdf)

Eosphorus



MEMBERS

Alexander Ngo  
Ivan Cuevas-Jimenez  
Jarret Hartwig  
Diego Perea  
Aidan Anuskiewicz

Logan Resendez  
Alessandro Cauvi  
Aldo Lopez

ADVISORS

SDSU  
Dr. Pablo Machuca

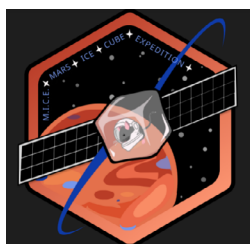
EOSPHORUS MISSION

The goal of the project is to design a mission to send an orbiter (Eosphorus) and surface probe (Atropos) to Venus. The orbiter will improve the gravitational model of Venus and map the lower-level atmospheric temperature distribution. The probe will detect and measure surface-level phosphine concentration, and determine the chemical composition of the soil. A prototype will demonstrate key technologies of the probe such as attitude control, communications, and sampling of the atmosphere during descent.

Youtube Video: <https://www.youtube.com/watch?v=D6uP0a0-23Y>

Poster: [https://aerospace.sdsu.edu/design-day/files/2025/eosphorus\\_mission\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/eosphorus_mission_poster.pdf)

MICE



MEMBERS

Kiril Yampolsky  
Kyle Hyunh  
Daniel Green  
Santiago Ulloa

Devin Patel  
Jared Agos  
Dylan Spiker  
Ryan Henderson

ADVISORS

SDSU  
Dr. Pablo Machuca

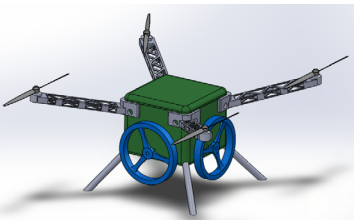
MARS ICE CUBESAT EXPEDITION

Mars Ice CubeSat Expedition has the goal to develop a scalable approach to planetary mapping using SmallSat technology to obtain high-resolution data without needing large expensive hardware. Two main objectives are to map near-surface ice deposits in mid-latitude regions of Mars, and to validate aerobraking technologies using SmallSats.

Youtube Video: <https://www.youtube.com/watch?v=7TByuBxkuKs>

Poster: [https://aerospace.sdsu.edu/design-day/files/2025/mice\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/mice_poster.pdf)

Project G-7



MEMBERS

Ryan Henderson  
Alessandro Cauvi  
Jarrett Hartwig  
Ivan Cuevas-Jimenez

ADVISORS

SDSU  
Dr. Roni Goldshmid

HOVER STABILITY DRONE

By using reaction wheels, a drone can correct deviations in pitch and roll so it can maintain a stable orientation with low reliance on aerodynamic forces or motor thrust adjustments. This method could create better stability, reduce noise, and provide improved attitude control in various conditions.

Project Gridlock



MEMBERS

Aidan Anuskiewicz  
Ruby Cave  
CJ Flores

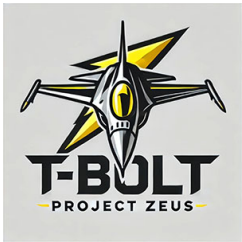
ADVISORS

SDSU  
Dr. Roni Goldshmid

INVESTIGATION ON GRID FIN GEOMETRY AND ITS AERODYNAMIC EFFECTS IN SUBSONIC FLOW

Our project focuses on investigating and optimizing the aerodynamic performance of grid fins by comparing two previously studied geometries to our own custom grid fin geometry. Previous studies and their findings informed our design for our grid fin. All grid fins were tested in the subsonic wind tunnel with data collected by the force-balance system and the flow was visualized with smoke.

Project Zeus



MEMBERS

Brandon Ton  
Faerich Nieva  
Jacob Warren  
Mercedes Flores

ADVISORS

SDSU  
Moises Ortiz-Flores  
Njata Holland  
Tyler Lui  
Geoffrey Butler

ADVANCED PILOT TRAINER

Our team has been tasked with designing a next-generation advanced pilot trainer to succeed the T-38C, the current training aircraft used in the U.S. Air Force's Specialized Undergraduate Pilot Training (SUPT) program. This land-based aircraft will train pilots in the fighter and bomber track and Introduction to Fighter Fundamentals (IFF), equipping them with the skills needed to transition into modern combat aircraft while meeting U.S. Air Force (USAF) operational requirements.

ReconRoost



MEMBERS

Joel Sampol  
Joshua Baker  
Anthony Cortes  
Ryan Reno

ADVISORS

SDSU  
Dr. Joseph Katz

BATTERY SWAPPING SECURITY DRONE

Our drone aims to provide a more efficient and thorough alternative to conventional security cameras. The drone will be able to cover blind spots and keep constant surveillance of a perimeter. The flight time will be optimized due to our ability to autonomously swap out the drones battery at its landing station. We will also design a lightweight structure to conserve battery for when it is patrolling.

Seal Team 6



MEMBERS

Luca Capperucci  
Sean Hodgson  
Yaseen Abdullah  
Abdulaziz Alqubayli

Ahmed Mohamed  
Jackson Green  
Emilio Spadaro

ADVISORS

SDSU  
Geoffrey Butler

T-16 SEAL

The T-16 Seal is a versatile advanced pilot trainer aircraft designed for training pilots on modern fighters. It features innovative design elements for improved maneuverability, control, and efficiency. With reliable engines, low maintenance costs, and the ability to handle both short and long-range missions, the T-16 is a competitive option for advanced pilot training.

Team Tezca Talon



MEMBERS

Remi I. Chappelle  
Darin A. Jackson  
Andrew J. Lovejoy  
Peter Y. Nyden

Dalhia A. Ruiz-Fernandez  
Adrian R Saldaña  
Thomas D. F. Smith

ADVISORS

SDSU  
Geoffrey Butler

TEZCA TALON

The AIAA Homeland Defense Interceptor competition tasks students with designing an unmanned, all-weather fighter for counter air patrol and interception missions. The Tezca Talon is optimized for supersonic interception and operates from any NATO-standard airfield. This project assesses its design, mass properties, aerodynamics, propulsion, performance, stability, control, and life cycle costs.

Poster: [https://aerospace.sdsu.edu/design-day/files/2025/tezca\\_talon\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/tezca_talon_poster.pdf)

The Falconers



**MEMBERS**  
Ahmed Mohamed  
Yaseen Abdullah  
Abdulaziz Alqubayli  
Max Arthur

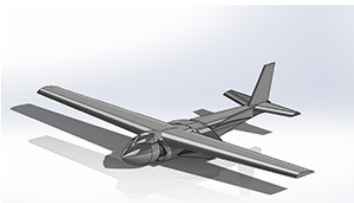
**ADVISORS**  
SDSU  
Dr. Joseph Katz

HIGH-SPEED CAMERA DRONE FOR MOTORSPORT FILMING

As motorsports have evolved with faster technology, traditional camera systems have struggled to match the agility and speed required to keep up with motorsports while delivering immersive aerial photography. The use of camera drones in sports massively enhanced the viewing experience by having the camera drone follow the racers closely through every turn, making it seem that the view is right behind the driver.

Poster: [https://aerospace.sdsu.edu/design-day/files/2025/the\\_falconers\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/the_falconers_poster.pdf)

The High Ground



**MEMBERS**  
Briana Martinez  
Ryan Reno  
Jack Hallonquist  
Joshua Baker  
Lance Baldemeca  
Joel Sampol

**ADVISORS**  
SDSU  
Geoffrey Butler

INNOVATIVE CLOSE AIR SUPPORT

The design of a more efficient, cost effective and newly designed close air support aircraft with the support of Geoffrey Butler. We will be using classic and new ideas implemented from the A-10, F-15, and Harrier Jet. We will be showcasing our design with models and explaining its innovation to previous close air support aircraft.

The Tlālōc



**MEMBERS**  
Ryan Harrison  
Bryan Ramirez  
Jenna Schradly  
Andrew Lovejoy

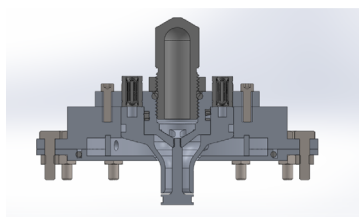
**ADVISORS**  
SDSU  
Dr. Joseph Katz  
Dr. Roni Goldshmid

THE TLĀLOC - NATURAL DISASTER RELIEF DRONE

The Tlālōc is a low-cost, highly adaptable solution for initial disaster relief, addressing critical gaps in early response efforts. With a one-time manufacturing cost of \$3,000, it's designed to be affordable and mission-configurable for various first responder needs. Though optimized for disaster scenarios, its durability and versatility make it effective for tasks like suspect pursuits or remote-area search and rescue. The Tlālōc ensures that ground teams are better equipped in the most critical moments—saving lives quickly, efficiently, and affordably.



Throttling Injector



MEMBERS

Kyle Enriquez  
Diego Perea  
Jack Hallonquist  
Devin Patel

ADVISORS

SDSU  
Dr. Roni Goldshmid

THROTTLING INJECTOR

Our team is designing a throttleable pintle injector for use in a rocket thrust chamber. It will use separate fuel and oxidizer inlet ports with a movable sheath that throttles both fuels at once. It will outline the mixture ratio and steps taken to optimize flow in the design and how we throttle it.



USCG Hoist Control Systems



MEMBERS

David Shaker  
Liam Stransky  
Michael Konshin  
Cameron Brossart  
Ashley Gray

ADVISORS

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Dr. Joseph Katz  
Dr. Xiaofeng Liu

MITIGATING HOIST LOAD SPIN INDUCED BY HELICOPTER ROTOR WASH

This project focuses on mitigating hoist load spin induced by helicopter rotor wash during rescue operations. A scaled helicopter system was used to quantify induced torque at various distances from the rotor blades through dynamic and static force measurements. By identifying spin hotspots and dead zones, the maximum measured torque guided the design of an active control module to counteract spin. The ultimate goal is for the implementation of the module to enhance the stability, safety, and efficiency of rescue missions.



Poster: [https://aerospace.sdsu.edu/design-day/files/2025/uscg\\_hoist\\_control\\_systems\\_poster.pdf](https://aerospace.sdsu.edu/design-day/files/2025/uscg_hoist_control_systems_poster.pdf)

# CIVIL, CONSTRUCTION & ENVIRONMENTAL ENGINEERING

## AMES Inc. (Team 14)



### MEMBERS

Luke Simanek  
Deion Nguyen  
Donovan Childs  
Luis Robles  
Nicholas De Philippis  
CJ Pallach

### ADVISORS

SDSU  
James Haughey

### UCSD JACOBS MEDICAL CENTER TOWER 2

The surging demand for accessible and exceptional health services has garnered the overwhelming need to expand the reach of UCSD Health. UCSD’s Jacob Medical Center stands as a shining example in the medical field. AMES Inc. intends to complement the design and engineering of UCSD Jacobs Medical Center 2. A comprehensive engineering initiative will be undertaken to surpass all expectations with the design of the new 250-bed hospital tower, 180,000 sf outpatient pavilion, and the expansion of the central utility plant.

**Youtube Video:** <https://www.youtube.com/shorts/uJFHbb9o078>

**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team14\\_ames-inc\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team14_ames-inc_sp25.pdf)

## Apex Construction, Inc.



### MEMBERS

Parker Bell  
Jordan Foley  
Bryce Hepner  
Eric Ho

### ADVISORS

SDSU  
Paul Jackson

### SDSU MISSION VALLEY RIVER PARK

Apex Construction, Inc. is leading the Mission Valley River Park project from preconstruction to completion. This 34-acre development integrates flood mitigation, environmental restoration, and recreation. The project features LED park lighting, multi-use fields, playgrounds, and a 2-mile hike and bike loop. Key infrastructure includes adaptive flood basins, bioswales, and underground electrical systems. Construction repurposes materials from Qualcomm Stadium, reducing environmental impact while ensuring long-term resilience and sustainability for the community.



**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team1\\_apex-construction\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team1_apex-construction_sp25.pdf)

## AquaFlow Engineering (Team 3)



### MEMBERS

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Amani Taraman  
Emily Truong  
Chrisopher Lopez

### ADVISORS

SDSU  
Dr. Hassan Davani  
Dr. Christy Dykstra

### ENCINITAS COMMUNITY PARK STORMWATER CAPTURE AND REUSE

Our project aims to develop an advanced stormwater capture, treatment, and reuse system to provide a sustainable irrigation solution for Encinitas Community Park. The system is designed to treat stormwater to potable standards, ensuring safe and efficient irrigation. To accommodate fluctuating rainfall patterns, we have integrated a strategically designed storage tank and pump station, optimizing water availability throughout the year. This approach enhances water conservation efforts while promoting long-term environmental and community benefits.

**Youtube Video:** <https://www.youtube.com/watch?v=Ai5CVge91Fc>

**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team3\\_aquaflow-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team3_aquaflow-engineering_sp25.pdf)

AquaTerra Engineering (Team 11)



MEMBERS

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Jesus Abaunza  
Karl Songco  
Justin Crabajales

ADVISORS

**STANTEC**  
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Ed Othmer PE  
Anthony Cotts PE  
  
**SDSU**  
James Haughey

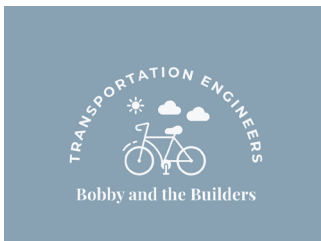
PUMP STATION D OUTFALL DESIGN AND ENVIRONMENTAL PERMITTING

Stormwater Pump Station D in San Diego’s Old Town community is in need of upgrades to accommodate future stormwater flows. The existing outfall is undersized and unable to support the planned improvements. The project objectives include designing a new force main outfall, identifying environmentally sensitive areas impacted by the project, reviewing geotechnical analyses, conducting hydraulic analysis, determining parcel ownership for easements, assessing post-construction stormwater requirements, and obtaining necessary permits from relevant agencies.



**Youtube Video:** <https://www.youtube.com/watch?v=AuLea-tWSIo>  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team11\\_aqua-terra-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team11_aqua-terra-engineering_sp25.pdf)

Bobby and The Builders (Team 21)



MEMBERS

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Leen Albeik  
Carlos Fuentes Jr.  
Ivan Espinosa  
Dimah Al Aboosi  
Samma Mohammed Ali  
Maryam Alodeesh

ADVISORS

**QIC**  
Kirk Bradbury  
  
**SDSU**  
Jeremy Lahaye

VISTA INLAND RAIL BIKE TRAIL

The Vista Inland Rail Bike Trail will be built between Mar Vista Dr. and Civic Center Dr. and connect the streets with a safe, ADA-compliant Class I bike path parallel to the Sprinter tracks. The project minimizes utility and property impacts while enhancing accessibility. Some key design challenges include integrating the path within the North County Transit District (NCTD) right-of-way and ensuring safe, seamless connectivity for cyclists and pedestrians. The result will be a sustainable and efficient transportation corridor for the community.



**Youtube Video:** <https://www.youtube.com/watch?v=Q2aQGCJNdcY>  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team21\\_bobby-and-the-builders\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team21_bobby-and-the-builders_sp25.pdf)

Build Masters Construction (Team 10)



MEMBERS

Chandler Kern  
Diego Garcia  
Kaveh Erfani  
Vito Russo  
Noah Erazo  
Joseph Escandon

ADVISORS

**HENSEL PHELPS**     **SDSU**  
Ryan Burbach     James Haughey  
Elijah Elliott  
  
**GROUP DELTA**  
Chris Vonk  
Rob Stroop

SDSU NORTH LIFE SCIENCES RETAINING WALL AND FOUNDATIONS PROJECT

In SDSU’s ongoing commitment to its students and staff, the university has selected a location adjacent to Canyon Crest Drive for a new North Life Sciences Building. Build Masters Construction has been assigned the task of designing an appropriate retaining wall and accompanying foundations for the new facility which will service the university for many years into the future.



**Youtube Video:** <https://www.youtube.com/watch?v=5ltpuGmjrTo>  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team10\\_build-masters-construction\\_sp25\\_rz.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team10_build-masters-construction_sp25_rz.pdf)

Coast to Tap Engineering (Team 2)



MEMBERS

Selin Childs  
Ryan Spaulding  
Justin Burns  
Jillian Seymour  
Sydney Geoffrion  
Emily Wright

ADVISORS

**SDSU**  
Ramin Eskandarzadeh Yazdi  
Mark Filanc  
**FILANC**  
Gary Silverman

SOUTH COAST WATER DESALINATION PRETREATMENT

In this project, we design a pretreatment system that focuses on removing iron and manganese from the influent water coming from underground wells located at Doheny State Beach in Dana Point. The pretreatment process prepares the influent for its next steps through reverse osmosis and the remainder of the treatment train.

**FILANC**

**Youtube Video:** <https://www.youtube.com/watch?v=RnVhT5GC9NE>

**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team2\\_coast-to-tap-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team2_coast-to-tap-engineering_sp25.pdf)

Finjan Construction



MEMBERS

Lucy Plahn  
Abdullah Alrubaye  
Alan Stater  
Diego Cabrera

ADVISORS

**SDSU**  
Paul Jackson

SNAPDRAGON STADIUM

Finjan Construction is an accomplished Design-Build general contractor that is building the Snapdragon Stadium project. The construction of this 35,000 occupant multi-use stadium will require the best management and building practices that Finjan embodies as a company. Design management, maintaining a constrained schedule, and dutiful trade management will all be of the top priority to deliver another successful project.



**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team2\\_finjan-construction\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team2_finjan-construction_sp25.pdf)

Founders Four Construction



MEMBERS

Jake Anger  
Cole Dipretoro  
Jacob Rivers  
Tristen Montalvo-Benedetto

ADVISORS

**SDSU**  
Paul Jackson

SHARP CHULA VISTA MEDICAL OFFICE BUILDING

Founders Four Construction is leading the development of a three-story, 75,000-square-foot medical office building (MOB) in Chula Vista, CA, in partnership with Sharp Rees-Stealy Medical Group and HGW Architecture. The facility will provide primary and specialty care, urgent care, radiology, cardiology, neurology, and more. Strategically located to enhance healthcare services in the South Bay, this project is expected to be completed by October 2025, creating 80 permanent jobs while delivering a high-quality, patient-centered environment.



**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team3\\_founders-four-construction\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team3_founders-four-construction_sp25.pdf)

Hydrocivils (Team 5)



MEMBERS

Bryan Quezada  
Isaac Mendez  
Emma Rydeen  
Tabatha Dill  
Daniel Angel  
Stephanie Morales

ADVISORS

**SEJPA**  
Tom Falk  
Mike Konicke  
**FILANC**  
Andrey Hunt  
**SDSU**  
Thomas Zink  
Jennifer Sager  
Mark Filanc

THE WANKET RESERVOIR REHABILITATION PROJECT

The improvement plan aims to enhance the hydraulic, structural, and drainage systems of the reservoir located adjacent to Encinitas Ranch Golf Course. The existing tank, which previously stored drinking water, will be repaired to capture stormwater and manage its disposal per applicable regulations. The civil improvement entails developing a grading plan, designing a stormwater collection system, confirming hydraulic pressures, and detailing necessary concrete repairs inside the tank. Additionally, we will prepare construction cost estimates, and ensure compliance.



Youtube Video: <https://www.youtube.com/watch?v=yAwpUYUVH8s>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team5\\_hydrocivils\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team5_hydrocivils_sp25.pdf)

K-SHAM Engineers (Team 19)



MEMBERS

Abby Nguyen  
Abdulah Al Ibrahimy  
Jet Archuleta  
Mouad Bennouna  
Nader Ibrahim  
Ramzi Sadek  
Vincente Luis Viray

ADVISORS

**QIC**  
Kirk Bradbury  
**BALFOUR BEATTY**  
Craig Chambers  
Jesus Cruz  
**CITY OF SAN DIEGO**  
Ahmadi Hossien  
**ODIN CONSTRUCTION SOLUTIONS**  
Sam Kanaan  
**SDSU**  
Brandon Farmer  
Dr. Julio Valdez  
Sam Amen

VISTA INLAND RAIL BIKE TRAIL

A multifaceted project situated in the City of Vista stretching between the Civic Center Station and Mar Vista Drive. This scope focuses on Phase Three, connecting two sections of the Inland Trail located within the SPRINTER line's right of way of the North County Transit District. The three key objectives of this project are to create a class one bike path parallel to the sprinter tracks, minimize utility and property impacts, as well as provide a safe and ADA compliant bike path.



Youtube Video: <https://www.youtube.com/watch?v=w7R7yp-dPBI>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team19\\_k-sham-engineers\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team19_k-sham-engineers_sp25.pdf)

Kings Engineering (Team 16)



MEMBERS

Logan Dolle  
Colby Lau  
Reid Mccaffrey  
Cade Torgerson  
Alyssa Johnson  
Andrew Wojciechowski  
Nayef Alotaibi

ADVISORS

**SDSU**  
Dr. Julio Valdes  
**BLUE LAKE CIVIL**  
Michael Baker

NEWHALL BIKE PATH - RETAINING WALL

Our team planned and designed a new bike path for the city of Santa Clarita in the Newhall area, connecting the existing bike path to the new overpass expansion and grading the existing soil to allow for a bike trail expansion under the overpass. Additionally, we designed a retaining wall to maintain the existing conditions of the San Francisquito Creek, soils, and overpass.

Youtube Video: <https://www.youtube.com/watch?v=tUgnEoiG7uM>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team16\\_kings-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team16_kings-engineering_sp25.pdf)



LGCN Builders



MEMBERS

Jared Lorey  
Aiden Crooks  
Hector Novela  
Aaron Greene

ADVISORS

SDSU  
Paul Jackson

SNAPDRAGON STADIUM

LGCN Builders is preparing to launch a collaborative design-build project for Snapdragon Stadium, the home of San Diego State University (SDSU) football. Owned and operated by SDSU, the stadium will also host a variety of events beyond football. This project includes the design and construction of the 35,000 capacity multi-use stadium as future home for SDSU Aztec football, professional soccer, rugby, concerts and more. With a budget of \$310 million, construction is set to begin on May 17, 2025, with completion expected by May 20, 2027.

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team4\\_lgcn-builders\\_sp25-mh.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team4_lgcn-builders_sp25-mh.pdf)



Medal Engineering Consultants (Team 9 )



MEMBERS

Vinni Mini  
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Donald Ahles  
Ethan Avila  
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ADVISORS

HENSEL PHELPS SDSU  
Ryan Burbach Nensi Lakrori  
Elijah Elliott  
GROUP DELTA  
Chris Vonk

SDSU NORTH LIFE SCIENCES (NLS) RETAINING WALL & FOUNDATIONS

We are tasked with developing engineering documents for the new SDSU North Life Sciences Building with a focus on the retaining wall and foundation analysis and design. Due to the steep slope on the southwest side of the site the building requires a significantly large retaining wall which will require an in depth understanding of geotechnical and structural engineering.

Youtube Video: <https://www.youtube.com/watch?v=TXCakgW6FKc>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team9\\_medal-engineering-consultants\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team9_medal-engineering-consultants_sp25.pdf)



MedBuild Construction LLC.



MEMBERS

Ines DaCruz  
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ADVISORS

SDSU  
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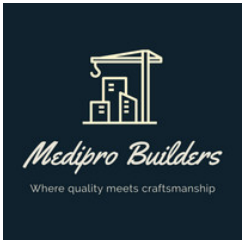
CHULA VISTA SHARP MEDICAL OFFICE BUILDING

The Sharp Medical Office Building is a 75,000-square-foot design-build project in Chula Vista, CA. MedBuild Construction and HGW Architects are partnering with Sharp HealthCare to deliver a three-story medical facility with a 375-stall parking structure, connected via a second-floor bridge. The facility will offer primary, specialty, and urgent care, along with radiology, cardiology, neurology, and lab services. The project will begin in the summer of 2026, and will last approximately one year, with a rough overall budget of \$60 million.

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team5\\_medbuild-construction-llc\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team5_medbuild-construction-llc_sp25.pdf)



MediPro Builders



MEMBERS

Brianna Lopez  
Gustavo Mendez  
Yarel Sanchez Rojas  
Elizabeth Cravioto Guerra

ADVISORS

SDSU  
Paul Jackson

5451 MEDICAL OFFICE BUILDING CLINIC

5451 Medical Office Building (MOB) Clinic is a 20,000 SF tenant improvement project located in La Jolla, CA that will include upgrading new clinical and staff spaces to enhance the overall patient experience. In addition to landscaping and exterior improvements, this project will include seismic upgrades, building infrastructure improvement, and overall path of travel upgrades. The MediPro Team will develop estimates, site logistic plannings, schedules, risk and document management, and safety approaches to ensure project success.



Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team6\\_medipro-builders\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team6_medipro-builders_sp25.pdf)

MSRD Construction Firm



MEMBERS

Michael Stathorakis  
Richard Dauti  
Luke McQuaid  
Nathan Robinson

ADVISORS

SDSU  
Paul Jackson

SDSU MISSION VALLEY RIVER PARK

Public use park, including public transportation via the San Diego Metropolitan Transit System (MTS) trolley system, 34-acre river park along the San Diego River. Led by MSRD for San Diego State University, it aims to enhance sustainability, expand the campus, and provide public recreational spaces while supporting urban growth. The park is located on the south side of Snapdragon Stadium.



Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team7\\_msrd-construction-firm\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/jackson-team/team7_msrd-construction-firm_sp25.pdf)

Nexgen Civil Engineering (Team 20)



MEMBERS

Karleigh Cowan  
Summer Westmoreland  
Max Dublirer  
Faris Kawwa  
Stefan Conlee  
Olivia Zamudio

ADVISORS

QIC  
Kirk Bradbury  
SDSU  
Jeremy Lahaye

VISTA INLAND RAIL BIKE TRAIL

Sponsored by SANDAG and ultimately owned by the City of Vista, this project aims to connect two sections of the Inland Rail Trail within the NCTD Sprinter right-of-way. The primary objectives include creating a Class I bike path that ensures safety, ADA compliance, and minimal utility and property impacts. The project encompasses transportation, structural, and water resource engineering, strongly focusing on sustainability and managing existing utilities and constraints.



Youtube Video: [https://www.youtube.com/watch?v=\\_Wd-T9zDw0s](https://www.youtube.com/watch?v=_Wd-T9zDw0s)

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team20\\_inland-rail-trail-presentation\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team20_inland-rail-trail-presentation_sp25.pdf)

RAD PL Enterprises (Team 17)



MEMBERS

Lizette Valdez-Sanchez  
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Raphael Rivas Duran

ADVISORS

**KPFF**  
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Bryon Spice  
Evan Lakin  
**SDSU**  
Dr. Panagiotis Mitropoulos  
Jeremy Lahaye

WALNUT & 5TH AVENUE MIXED USE DEVELOPMENT

The Walnut and 5th Avenue Mixed-Use Development is a 13-story structure featuring housing and retail space. To promote inclusivity, a section of the housing units will be reserved for low-income families. The development includes storage facilities, residential/visitor/bicycle parking as well as a recreation center, yoga studio and gym. The ground level will house retail spaces, meeting rooms, and a welcoming lobby creating a vibrant and accessible community environment.



**Youtube Video:** <https://www.youtube.com/watch?v=GJL2ARdAYUM>  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team17\\_rad-pl-enterprises\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team17_rad-pl-enterprises_sp25.pdf)

Reinforced Divas Engineering (Team 13)



MEMBERS

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Michaela Wong  
Kayla Mendoza  
Aron Russom

ADVISORS

**SDSU**  
Jim Haughey

UCSD JACOBS MEDICAL CENTER TOWER 2

The development of UCSD Jacobs Medical Center Tower 2 will be located at 9300 Campus Point Dr, and includes building a 250-bed hospital tower, a multi-purpose facility, an expanded Central Utility Plant (CUP), and an outdoor courtyard. The project will require site development of the new building, utilities, structural build shell and foundation design, and all relevant design codes.

**Youtube Video:** <https://www.youtube.com/shorts/taM6lcnJf4w>  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team13\\_reinforced-divas-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team13_reinforced-divas-engineering_sp25.pdf)

Salt-Free Solutions (Team 1)



MEMBERS

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Mia Pollasky  
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Ramin Eskandarzadeh Yazdi  
Mark Filanc  
**FILANC**  
Gary Silverman

SOUTH COAST WATER DESALINATION PRETREATMENT

Salt-Free Solutions (SFS) is working with Filanc Engineering to design a pre-treatment system for a new desalination plant. The project will focus on removing iron and manganese from seawater before the microfiltration and reverse-osmosis stages. SFS will determine the appropriate sizing and layout for tanks and chemical systems, evaluate environmental impact, and develop a construction plan with a cost estimate and site plan. SFS is committed to delivering an efficient, sustainable design that ensures the project's success.



**Youtube Video:** [https://www.youtube.com/watch?v=5UR5\\_kd225c](https://www.youtube.com/watch?v=5UR5_kd225c)  
**Poster:** [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team1\\_salt-free-solutions\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team1_salt-free-solutions_sp25.pdf)

Storm Guard Engineering (Team 12)



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ADVISORS

**STANTEC**  
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Ed Othme PE  
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**SDSU**  
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PUMP STATION D OUTFALL DESIGN AND ENVIRONMENTAL PERMITTING

The Stormwater Pump Station D Outfall is located in Old Town, San Diego, and is responsible for the surrounding area’s flood control regulation. This project requires improvements to accommodate a predicted increase in stormwater flow. Important factors to consider include restricted boundaries due to surrounding properties such as an adjacent railroad, environmental constraints, and freeway limitations. Storm Guard Engineering’s purpose is to design an upgraded conveyance system that will manage larger volumes of rainfall that will later discharge into the San Diego River.



Youtube Video: <https://www.youtube.com/watch?v=1JA0t4QY8eM>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team12\\_storm-guard-engineering\\_sp25\\_updated.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team12_storm-guard-engineering_sp25_updated.pdf)

StormGuard Engineering (Team 4)



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ENCINITAS COMMUNITY PARK STORMWATER CAPTURE AND REUSE

This project determines the amount of rainfall that can be collected, stored, and reused at the Encinitas Community Park to provide irrigation through drought conditions. To accomplish this, a hydrology study is conducted to determine the amount of collectable water and the method of storage on site. Then, a water treatment system is designed to ensure the water can be used for irrigation. Finally, a pump station is designed to incorporate the recycled water into the existing irrigation system at the park.

Youtube Video: <https://www.youtube.com/watch?v=oEc9JwWMmnk>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team4\\_stormguard-engineering\\_sp25-1.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team4_stormguard-engineering_sp25-1.pdf)

Stormworks (Team 6)



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SAN VICENTE PUMPED STORAGE (SVPS) PROJECT

The San Vicente Pumped Storage Project is an innovative energy solution utilizing the San Vicente Reservoir to generate 500 MW of renewable power daily. Our team is focusing on optimizing the tunnel conveyance system, balancing hydraulic efficiency, cost, and sustainability through a 30-year economic analysis. A key challenge is designing a tunnel that minimizes head losses. Additionally, we aim to create an effective spillway design for the upper reservoir to manage peak flows. Our design prioritizes performance, economic optimization, and long-term feasibility.



Youtube Video: <https://www.youtube.com/watch?v=oN9KKp1RfoU>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team6\\_stormworks\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team6_stormworks_sp25.pdf)

Streamline Engineering Solutions (Team 7)



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SAN VICENTE PUMPED STORAGE (SVPS)

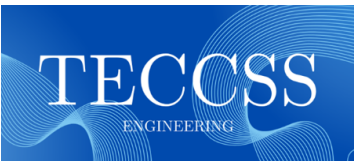
The San Vicente Pumped Storage (SVPS) Project will be built along Assessor Parcel Numbers (APNs) within the jurisdictions of the City and County of San Diego, covering an approximate work area of 1,837 acres. The project aims to generate 500 megawatts (MW) of renewable power daily over an 8-hour period by utilizing the existing San Vicente Reservoir as the lower reservoir and a newly constructed upper reservoir. Water will flow through a tunnel conveyance system, driving a combined pump-turbine to produce electricity. After the generation cycle, the water will be sustainably pumped back to the upper reservoir using renewable energy, creating a closed-loop system.



Youtube Video: <https://www.youtube.com/shorts/a-Qoo8pNcpc>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team7\\_streamline-engineering-solutions\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team7_streamline-engineering-solutions_sp25.pdf)

TECCSS Engineering (Team 18)



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WALNUT & 5TH AVENUE MIXED USE DEVELOPMENT

The proposed mixed-use building on 5th Avenue will feature housing and retail spaces. The basement will include storage, residential/visitor parking, and bicycle parking. The ground floor will have retail, a lobby, and meeting rooms. The second floor will offer amenities like a gym, yoga studio, and recreation center. Floors three through thirteen will house residential units, with a portion designated for low-income housing, promoting inclusivity and accessibility. This development will enhance the area by providing diverse living and commercial opportunities.



Youtube Video: <https://www.youtube.com/watch?v=MnjnKB9qlu8>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team18\\_teccss-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team18_teccss-engineering_sp25.pdf)

TOMRAK Engineering (Team 8)



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Katey Ortiz  
Joshua Tamayo

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Elijah Elliott  
  
**GROUP DELTA**  
Chris Vonk  
Rob Stroop

SDSU NORTH LIFE SCIENCES (NLS) RETAINING WALL & FOUNDATIONS

Our team is designing a retaining wall and foundation system for the SDSU North Life Sciences (NLS) Building to address the challenges of constructing on a steep slope. This project integrates structural and geotechnical engineering principles to develop a cost-effective and sustainable design that ensures stability and safety. Key considerations include soil mitigation, earthwork analysis, and construction logistics. Our solution aims to enhance the university's infrastructure while meeting industry standards for higher education science facilities.



Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team8\\_tomrak-engineering\\_sp25\\_rz.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team8_tomrak-engineering_sp25_rz.pdf)



Transit-Soil Engineering Partners ( Team 15)



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NEWHALL BIKE PATH RETAINING WALL

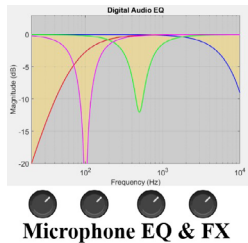
This project is to construct a Class I bike path and associated retaining wall(s) in the San Francisquito Creek channel beneath the Newhall Ranch Road Bridge. This link is required to provide connectivity to the extensive bike path network in the City of Santa Clarita to reduce vehicle emissions for a better environment.

Youtube Video: <https://www.youtube.com/watch?v=SXg7NGOSUtg>

Poster: [https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team15\\_transit-soil-engineering\\_sp25.pdf](https://ccee.sdsu.edu/explore/design-day/design-day-2025/posters/prince-team/team15_transit-soil-engineering_sp25.pdf)

# ELECTRICAL & COMPUTER ENGINEERING

## aztEQ



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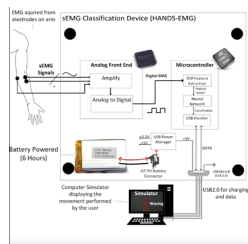
### aztEQ: Digital Microphone Equalizer

aztEQ is a compact, portable device that enhances the sound from a single microphone, before it is played through a speaker. The process begins by amplifying the signal from an attached microphone and sampling it. The sampled signal is then passed through a series of digital filters modifying the frequency content of the sampled audio. Utilizing the device's control knobs and buttons, the user alters the digital filters applied to obtain their desired audio profile.

**Youtube Video:** <https://www.youtube.com/watch?v=vpgv3MD5ilc>

**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/ece-team11-digital-filters-and-reverb-effect-for-live-music-and-speech.pdf>

## HANDS-EMG



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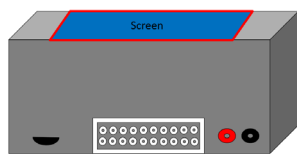
### HANDS-EMG

The HANDS-EMG device is a portable, battery-powered surface electromyography system that classifies hand movements using machine learning. It captures muscle activity signals from the forearm, enabling real-time, non-invasive monitoring and analysis. This technology supports applications in prosthetics and rehabilitation by providing accurate and efficient movement recognition. Designed for accessibility, HANDS-EMG offers a practical solution for enhancing user mobility and control.

**Youtube Video:** <https://www.youtube.com/watch?v=24S8prk70tl>

**Poster:** [https://electrical.sdsu.edu/design-day/files/2025/ece\\_team9-emg-hand-movement-classification.pdf](https://electrical.sdsu.edu/design-day/files/2025/ece_team9-emg-hand-movement-classification.pdf)

## S.D. Cables



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Glenn Pohly

### SHORT-BREAK DETECTOR

The MASIMO Short Break Detector integrates with a cable bend test machine and automates cable fault detection. Powered by an AVR128DB64 MCU, it supports AC/DC, halts tests on faults, and logs data to an SD card. A touch screen enables easy operation, enhancing reliability, efficiency, and accuracy in cable testing.

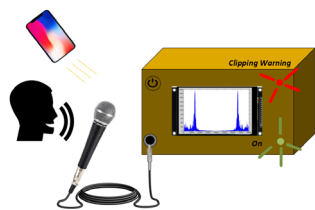


**Youtube Video:** <https://youtu.be/cxJwCj7Wjkh?si=GqmotC0qTKfnUA2E>

**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/ece-team-2-automated-multiconductor-cable-break-short-detector.pdf>



Team 12 - Noise Canceler



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Barry Dorr

AUDIO FREQUENCY DISPLAY

The system takes in an audio signal from a microphone and uses the STM32G491RE microcontroller to filter and display the different audio components of the signal. The electronics are housed inside a cabinet and output to an LCD display. The device also features two LEDs, one that lights up green when the device is on and one that indicates when the device is receiving too loud of an audio signal to process.

Youtube Video: <https://www.youtube.com/watch?v=tQh8UJX35Ug>

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team-12-noise-canceler.pdf>

Team 15 - Handheld Game Device



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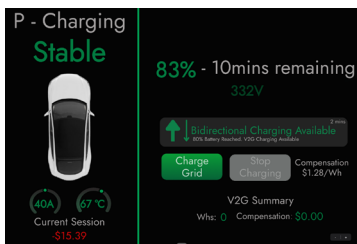
HANDHELD GAMING DEVICE

This handheld gaming device allows users to play video games on the go! With a massive 320 by 480 pixel, 16-bit color display, variable refresh rate speed using an innovating new technique, and crisp audio output, this device pushes its ATmega328P core to the limit! All firmware and games coded completely in embedded C with no external libraries and optimized for a total 2 KB SRAM and 32 KB flash program memory.

Youtube Video: <https://youtu.be/nLy6gsky0M0?si=Zlo9xU2K4HjR3e4a>

Poster: [https://electrical.sdsu.edu/design-day/files/2025/ece\\_team15-handheld-game-device.pdf](https://electrical.sdsu.edu/design-day/files/2025/ece_team15-handheld-game-device.pdf)

Team 4 BMS Project



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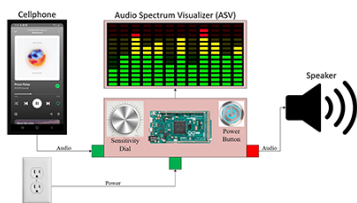
BATTERY MANAGEMENT SYSTEM FOR V2G CHARGING

The Battery Management System (BMS) project focuses on augmenting the current capabilities of an already strained power grid. This is achieved through Vehicle-to-Grid (V2G) charging. V2G charging allows the user of an Electric Vehicle (EV) to send energy to the grid during peak-usage hours; this is financially incentivized with a credit to the EV user. Energy will be taken by the EV from the grid during off-peak usage hours. Adherence to charging protocols, ISO 15118 and SAE J2847/2, strengthen market-ready applications.

Youtube Video: <https://youtu.be/haF7XnPuHjQ>

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team-4-battery-management-system.pdf>

Team ASV



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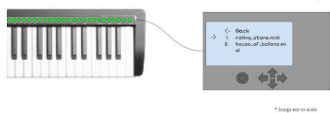
AUDIO SPECTRUM VISUALIZER

Our project is an audio spectrum analyzer, which takes an audio signal as input and outputs the volumes of different frequency bands on an LED display. It uses an Arduino Due for signal processing, which takes an analog signal in from a standard audio jack, does analog to digital conversion, and performs filtering and analysis on the signal stream. It uses an off the shelf addressable LED strip to display the volume, which will be mounted on a large wooden display for easy viewing.

Youtube Video: <https://www.youtube.com/watch?v=iU9XphwL3h8>

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team14-audio-spectrum-visualizer.pdf>

Team Ate



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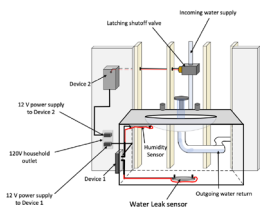
L.E.D PIANO

Our L.E.D Piano project serves as a way to introduce playing the piano to beginning and intermediate players. Its main objective is to have LEDs light up and indicate to the user which keys to play. The accuracy of these keypresses will be communicated with a controller that's connected via the MIDI output. The data from the controller will then be processed and compared to the currently lit keys to determine the accuracy and display the accuracy on the controller's internal display.

Youtube Video: <https://youtu.be/p3TEv5lpJG4>

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team8-midi-interfacing-led-piano-instructor.pdf>

The Flow Stoppers



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ADVISORS

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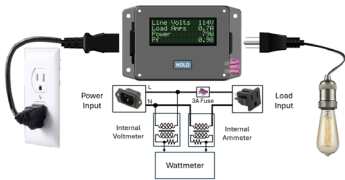
WATER LEAK AND HUMIDITY DETECTION SYSTEM

The system is a water leak detector that detects leaks using capacitive sensing with an Arduino Uno microcontroller. When a leak is detected, it sends an email alert and automatically shuts off a valve to prevent damage. A battery backup ensures operation during power outages, and Bluetooth communication allows remote monitoring. Designed for reliability and automation, the system provides an effective solution for early leak detection and response, enhancing home safety and preventing potential water damage.

Youtube Video: <https://youtu.be/T89FBTh17qs>

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team-16-water-leak-detector.pdf>

W.A.S



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WATTAGE ANALYSIS SYSTEM

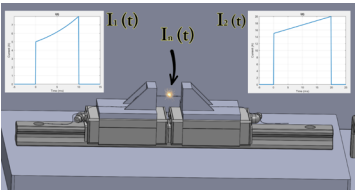
The Wattage Analysis System (WAS) is a single-phase pass through watt meter targeting appliances running from a 100V AC to 130V AC line voltage. The WAS measures current draw from 0.50A to 2.00A, power draw from 50W to 250W, and power factor from 0.80 to 0.99 with measurements tolerances of  $\pm 5\%$ .

Youtube Video: [https://youtu.be/p3gMVueUiWU?si=PiiRNYk\\_sVc6Tp6y](https://youtu.be/p3gMVueUiWU?si=PiiRNYk_sVc6Tp6y)

Poster: <https://electrical.sdsu.edu/design-day/files/2025/ece-team6-wattage-analysis-system.pdf>

# ELECTRICAL & COMPUTER AND MECHANICAL ENGINEERING

## Aztec Microwire Welding



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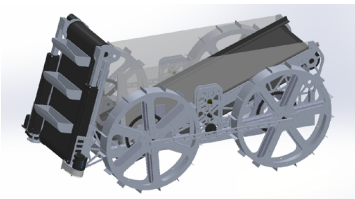
### MICROWIRE WELDER

The Microwire Welder enables precise micro-actuation alignment for both fabrication and repair of wires on the micron scale. Fine-gauge thermocouples are fabricated by applying a high current pulse to electrically fuse two metal materials at a butt-junction. Additionally, hot-wire anemometers are repaired by aligning a wire to the prongs for easy and consistent soldering. This device aims to function without a lot of trial and error or user experience.

**Youtube Video:** <https://www.youtube.com/watch?v=vkGZxjShN9U>

**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/joint-project-7-microwire-welder.pdf>

## C.R.E.E.D. - Propulsion Team



### MEMBERS

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William Traywick  
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Ryan Liu

### NASA LUNABOTICS - PROPULSION

Team CREED (Collegiate Rover for Extraterrestrial Excavation and Deposition) is representing San Diego State University in the NASA Lunabotics 2025 Competition. The team is tasked with the design and build of the propulsion system for a telerobotic rover capable of traversing, excavating, transporting, and depositing lunar regolith. This supports NASA's Artemis missions, in which they plan to use in-situ resources for lunar construction. The team will travel to Iowa State University to compete in a simulated deployment mission against other national universities.

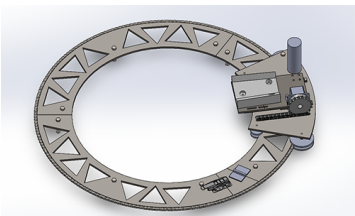
**Youtube Video:** <https://youtu.be/WbWH1TP72B4>

**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/joint-project-2-creed.pdf>

**SDSU**

Student  
Success Fee

## Palm Patrol



### MEMBERS

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Jackson Rayner  
Brandon Cooper  
Madison White  
Abdul Karim Tamim  
Leonardo Sebastian Martinez

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Brayden Chau  
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**MAX ENGINEERING**  
Max Winiarz

### ROBOTIC PALM TRIMMER END EFFECTOR DESIGN

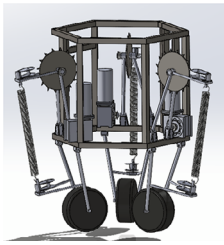
The robotic palm trimmer end effector is designed to replace manual palm trunk trimming and make trimming safer, easier, and cheaper. Using a circumferential track system and an active radial positioning stage, the tool will have a reach of 360° around the palm trunk. The trimmer will attach and interface with the Robotic Palm Elevator to achieve 6-degrees of motion around the palm tree. The Robotic Palm Tree Trimmer and Elevator will be operated manually utilizing the same controller and power source.

**Youtube Video:** <https://youtu.be/I2fOzd7-5IM>

**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/joint-project-5-palm.pdf>



Palm Patrol



MEMBERS

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Dante Monsalve  
Renz Carlo Tan  
Moises Mathew Edillor

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Raheed Isaak  
Ryan Maiden  
Lukas Velasco

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MAX ENGINEERING  
Max Winiarz

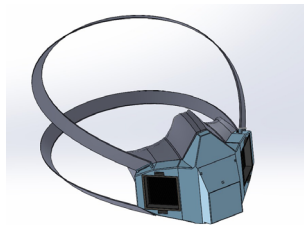
ROBOTIC PALM ELEVATOR

The Robotic Palm Elevator serves as a replacement for tree trimmers to move towards safer and efficient palm trimming. The elevator is to be installed around the tree and move vertically, controlled via use of a joystick controllable while applying constant tension and force on the arms. The elevator is also able to cut the fronds from the trees and hold it own weight. This is a continuation from last years project, designing and fabricating new components to complete the project.



Youtube Video: <https://www.youtube.com/watch?v=n2OgBgM5gKM>  
Poster: <https://electrical.sdsu.edu/design-day/files/2025/joint-project-4-palm.pdf>

SceneSafe



MEMBERS

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Alexander Griffin-Vigderovich

Elvis Thi  
Eric Smith  
Tye Williams  
Khiet Nguyen

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ATMOSENSE  
Dr. Mike Frank  
Tabib Hossain

GAS SENSOR INTEGRATED ELASTOMERIC HALF MASK RESPIRATOR FOR FIRST RESPONDERS

The joint Mechanical and Electrical team worked to develop an elastomeric half-mask respirator with integrated gas sensor technology for first responders. The final ergonomic design houses particulate matter, carbon dioxide, temperature, pressure, and humidity sensors connected via Bluetooth to a mobile app. This design demonstrates what is possible in the world of gas sensing and provides the groundwork for future iterations by AtmoSense.



Youtube Video: <https://youtu.be/ugN9m9GJeo>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project08.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project08.pdf)

S.T.O.R.K. (Specialized Transport & Observation Remote Kopter)



MEMBERS

Nathan Lozano  
Luis Laurean  
Eddie Meza  
Justin Ochoa  
Allan Valdez  
Luiz Gonzalez Bautista

Daniel Solomon  
Flavio Signoretti  
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Sophia Garcia

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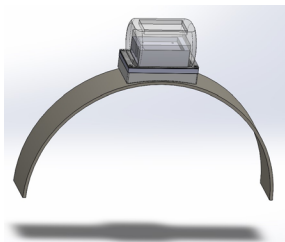
CSU – CALIFORNIA UNMANNED AERIAL SYSTEMS COMPETITION (C-UASC)

The California Unmanned Aerial System Competition requires students to design, integrate, and demonstrate a small Uncrewed Aerial System capable of waypoint navigation, package drop, package delivery, target identification, and target localization. This competition is organized by California State University and Mojave Air & Space Port at Rutan Field. This competition is points-based, and open to teams of students from universities, colleges, and community colleges. The competition will be held at the Mojave Air & Space Port at Rutan Field on June 7th, 2025.



Youtube Video: [https://youtu.be/lnmVD1\\_951k?si=6NM0xNscGqxZ8OpV](https://youtu.be/lnmVD1_951k?si=6NM0xNscGqxZ8OpV)  
Poster: <https://electrical.sdsu.edu/design-day/files/2025/joint-project-1-stork.pdf>

The Herd



MEMBERS

Zachary Watkins  
Chase Duncan  
Nolan Atkin  
Jose Cardoso  
Tommy Zheng  
James Allison

Nathan Phan  
Noah Frew

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**SDZWA**  
Dr. Kyra Swanson

ELEPHANT BEHAVIOR MONITORING COLLAR

This project designs a durable, affordable elephant tracking collar housing with waterproof, impact-proof (IP67) protection and solar recharging for continuous use. It includes sensors to monitor movement and health, transmitting data via LoRa for reliable long-range tracking. The 3D-printed, twist-lock housing integrates seamlessly with the collar. With a \$1,000 budget, it will be locally manufacturable in Kenya to support wildlife conservation through long-term, low-maintenance monitoring.



**Youtube Video:** <https://youtu.be/-WwNGPvaXFQ>  
**Poster:** <https://electrical.sdsu.edu/design-day/files/2025/joint-project-6-the-herd.pdf>



# MECHANICAL AND AEROSPACE ENGINEERING

## ASTELAR



### MEMBERS

Seth Rodriguez	Sierra Kocina
Jackelyne Hernandez	Tzu-Jen Su
Liyuu Tesfaye	Hector Hernandez
Matt Villanueva	Fred Ferreiro
Roberto Marquez	William Fischer
Ryan Kataoka	Mayhardona Narise Daniel
Julianna Molina-O'brien	

### ADVISORS

**SDSU**  
Dr. Pablo Machuca  
Dr. Scott Shaffar

### ORION - ORBITAL RESTORATION THROUGH INNOVATIVE OPERATIONS NETWORK

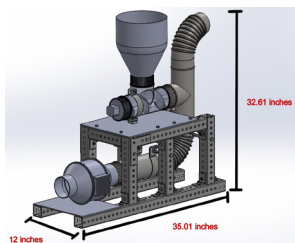
The Orbital Restoration through Innovative Operations Network (ORION) mission enhances satellite sustainability by providing in-orbit servicing in GEO. ORION consists of a depot and several servicer satellites that perform repairs, refueling, and debris tracking, reducing replacement costs and mitigating space debris. This mission aims to demonstrate the feasibility of on-orbit servicing, supporting long-term space operations and sustainability. ASTELAR, a joint AE/ME subteam part of ORION, will test robotic arm capabilities to repair solar panels through a prototype.

**Youtube Videos:** <https://youtu.be/QbXLN8POIH0>  
<https://www.youtube.com/watch?v=L-S5pYzsZLY>

**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project32.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project32.pdf)

# MECHANICAL ENGINEERING

## A.S.H.E.S.



### MEMBERS

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Riya Shah  
Jeremy Parks

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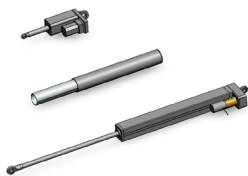
### EMBER GENERATOR FOR FIRE RESEARCH

Team ASHES was asked to develop an ember generator for wildfire research in order to simulate the behavior of embers at varying wind speeds. The ember generator burns wood pellets inside an ignition chamber to generate embers and uses a fan system to carry them out at a desired direction and speed. The system is compact and easy to transport. This device will be used to advance research of fire risks associated with Wildland-Urban Interface (WUI) vegetation and structures.

**Youtube Video:** <https://www.youtube.com/watch?v=jDDDSzqpacY>

**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project31.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project31.pdf)

## ACTUS



### MEMBERS

Joshua Hammond  
Matthew Steel  
Rich Tran  
Garrett Leach  
Jacob Black

### ADVISORS

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Andrew Simmons

### ELECTRIC ACTUATION FOR RETRACTABLE LANDING GEAR SYSTEM

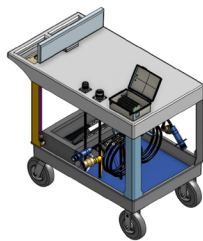
Many unmanned aircraft utilize electric power for systems that, on manned aircraft, have traditionally been hydraulically powered. This change can reduce overall aircraft weight and facilitate computer control of the system(s). For this project, the team will be tasked with designing, prototyping, and testing an electric actuation system for an existing hydraulically actuated landing gear configuration. Design and construction of test equipment will also be required.



**Youtube Video:** [https://youtu.be/whcx1Hyoz\\_8](https://youtu.be/whcx1Hyoz_8)

**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project13.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project13.pdf)

## Amped-Up



### MEMBERS

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### ELECTRICAL QUICK CONNECT VALIDATION TOOL

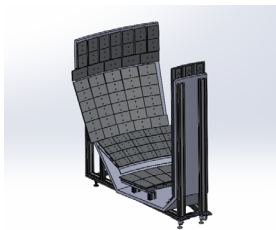
The “Electrical Quick Connect Validation Tool” project develops a portable test platform to verify Quick Connectors in Solar Turbines’ Titan 350 engine packages. These connectors link engine-mounted actuators and probes in Generator and Compressor Set packages. The tool ensures connection integrity, detecting failures from incorrect terminations during manufacturing and installation. It tests continuity for cables and control systems, preventing engine damage and operational issues while improving reliability in factory assembly.



**Youtube Video:** <https://www.youtube.com/watch?v=uEtFStj5tQA>

**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project27.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project27.pdf)

ARMOR



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Samuel Villegas Felix  
Sean Quirk

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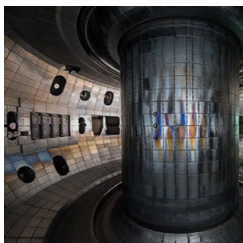
DIII-D VESSEL ARMOR SYSTEM

The DIII-D Tokamak nuclear fusion reactor requires an advanced armor tile attachment mechanism to support upcoming material upgrades. Our project introduces a novel tile geometry and adjustable attachment system designed to ensure heat flux resilience and precise tile alignment. Using simulations and calculations, we validate tile performance under extreme temperatures. Our prototype focuses on practical installation, enabling future material integration while addressing non-uniform wall structures for improved durability and ease of maintenance.



Youtube Video: <https://youtu.be/TDQOAlsodSI>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-17.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-17.pdf)

Automaton



MEMBERS

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Kenta Smith  
Cristian Medina  
Jesus Lopez  
Cameron Fong

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SURFACE PREPARATION UTILIZING THE DIII-D ROBOT SYSTEM

The project focuses on developing a new surface modification system for the DIII-D Tokamak nuclear fusion reactor's first wall, using a robotic solution. The system will enable the sanding of graphite tiles to remove impurities left behind after nuclear fusion runs, ensuring cleaner surfaces and improved reactor performance. The solution will integrate a sander and a 6-axis force-torque sensor with a UR-10 robot arm using a designed attachment apparatus.



Youtube Video: <https://youtu.be/sGykr3sTO7Q>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project10.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project10.pdf)

Aztec Ergonomics



MEMBERS

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Alexandria Ng  
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Georgie Rauls

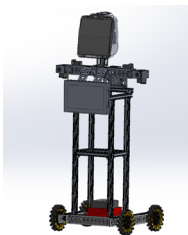
ERGONOMICS JIG (PHASE II)

Since 2016, Aztec Electric Racing (AER) has developed electric race cars for the Formula SAE (FSAE) competition. This project focuses on designing a modular ergonomic jig to optimize driver positioning within AER's Electric Vehicle. The jig will simulate various seating configurations, ensuring compliance with FSAE regulations while enhancing driver comfort and safety. Featuring adjustable components such as the seat, steering column, and pedal box, the jig enables precise ergonomic testing. Its collapsible design ensures easy storage and long-term usability.



Youtube Video: [https://youtu.be/JETpRH\\_X8rY](https://youtu.be/JETpRH_X8rY)  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project18.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project18.pdf)

Aztech Prime



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Lukas Ginsberg  
Joseph Dizon

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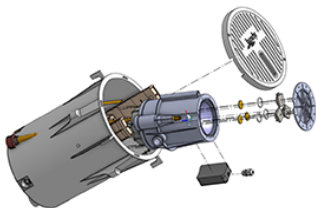
**HUMANOID ROBOTICS FOR SOCIAL AND EMOTIONAL INTERACTIONS**

In collaboration with the James Silberrad Brown Center of Artificial Intelligence, our team was responsible for developing a modular and dynamic humanoid robot that can evolve with the technological advancements in AI. The research lab will use this robot to integrate their own AI models geared towards social and emotional intelligence.

**Youtube Video:** <https://www.youtube.com/watch?v=Roug6lQKEj4>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project11.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project11.pdf)



BubbleStream



**MEMBERS**  
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Joshua Orcajo

**ADVISORS**  
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**FLUIDRA**  
Mark Bauckman

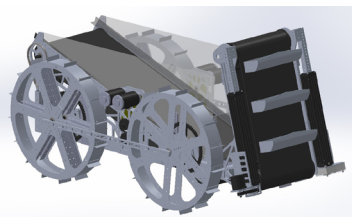
**LAMINAR WATER JET WITH MICROBUBBLES**

In the swimming pool industry, there are various designs of water features that use water and light to accentuate swimming pool aesthetics. One challenge is to bring enough light to a long stream of laminar flow to create a bright enough visual effect for the user. Given the idea that bubbles refract light, the project incorporates the use of ultrasonic piezotransducers to produce microbubbles through the process of cavitation and entrain microbubbles into Fluidra's Laminar Water Jet.

**Youtube Video:** <https://youtu.be/lybTUWJXb0I>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project15.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project15.pdf)

FLUIDRA

C.R.E.E.D. - Excavation and Deposition



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Jayvree-Michael Gonzales

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**RJL ENGINEERING**  
Ryan Liu

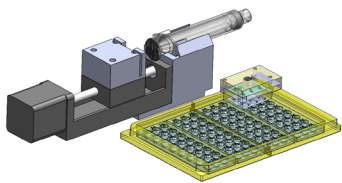
**NASA LUNABOTICS - REGOLITH HANDLING**

Team CREED (Collegiate Rover for Extraplanetary Excavation and Deposition) is representing San Diego State University in the NASA Lunabotics 2025 Competition. The team is tasked with the design and build of the Regolith handling system for a telerobotic rover capable of traversing, excavating, transporting, and depositing lunar regolith. This supports NASA's Artemis missions, in which they plan to use in-situ resources for lunar construction. The team will travel to Iowa State University to compete in a simulated deployment mission against other national universities.

**Youtube Video:** <https://youtu.be/WbWH1TP72B4>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/team3.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/team3.pdf)

**SDSU**  
Student  
Success Fee

C.R.O.M.E (Cell Rejuvenation Output Micro Element)



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Katherine Simms  
Mark Osorio  
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ALTOS LABS  
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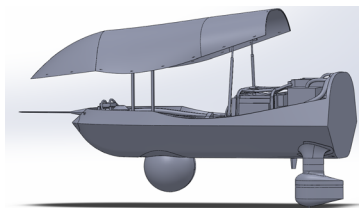
HIGH THROUGHPUT PLATFORM FOR CULTURING CELLS IN A LOW VOLUME, 3D MICRO-ENVIRONMENT

Developing treatments for diseases is slow and expensive. Our project speeds up this process by using cell growth chambers and an automated system to feed cells, remove waste, and introduce potential treatments for testing. By exposing cells to different drugs or therapies in a controlled environment, scientists can quickly see what works and what doesn't. This system allows more experiments to run at the same time, making it easier and faster to find effective cures, ultimately leading to better and more affordable treatments for diseases.

Youtube Video: <https://youtu.be/JGieFTkNgSo>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-12.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-12.pdf)



Cerberus



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Jason Lee  
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Tallon McDonough  
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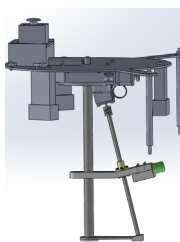
MQ-9A REMOTELY PILOTED AIRCRAFT RADOME REDESIGN

Our project aims to redesign the MQ-9 radome with two key objectives: improved aerodynamic efficiency during cruise and rapid access for maintenance. The new design must allow the radome to be opened, removed, or locked within 30 seconds, using a full-opening structure, panels, or other mechanisms. It must also remain secure in wet and windy conditions up to 20 knots. The solution should enhance operational efficiency while ensuring durability and ease of use for routine inspections and maintenance.

Youtube Video: <https://m.youtube.com/watch?v=RUGQBQZAQ60>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project19.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project19.pdf)



Deep Purple



MEMBERS

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Hayden Keyser  
Charles Taylor  
Andre Hozl  
Matthew Steinmetz

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ASML  
Kent Bruzzone

EUV SOURCE MODULE METROLOGY TOOL

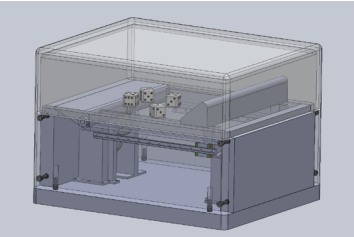
ASML focuses on developing and manufacturing Extreme Ultraviolet (EUV) lithography machines essential for producing computer chips. This process uses liquid tin ablated by a CO2 laser, including approximately 2,000 gas holes that guide tin to the proper disposal. Currently, ASML inspects these holes by hand which is inefficient and dangerous. Team Deep Purple has been tasked with designing a dual-axis robotic camera system to check which holes are blocked by tin debris. This increases the efficiency and safety of the cleaning process.

Youtube Video: [https://youtu.be/ckgultY\\_RIA](https://youtu.be/ckgultY_RIA)  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project24.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project24.pdf)





Dice Heroes



MEMBERS

Cayla Ballard  
Severen Brown  
Isaac Rodriguez  
Maxx Pastore  
Jennifer Aguirre

ADVISORS

**SDSU**  
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**QUALITY OF LIFE PLUS**  
Scott Huyvaert

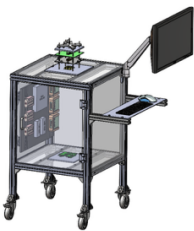
DICE ROLLER FOR DISABLED VETERANS

This project aims to develop a device designed to roll dice or similar objects. The device will be able to load, shake, and roll the dice without external assistance. It will be operated using a head switch push button, allowing users to launch and reload the dice for playing various games. The goal is to promote greater independence for individuals with paraplegia or quadriplegia, while connecting disabled veterans with more people to enhance their quality of life. QL+ has partnered with River Deep Alliance, Craig Hospital of Denver, and SDSU to execute this vision.



**Youtube Video:** <https://www.youtube.com/watch?v=PVg9IbE2Wvo>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-21.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-21.pdf)

Dispensable ME



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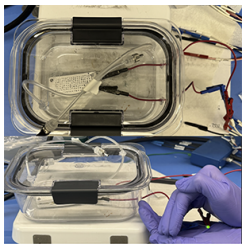
DISPENSING TEST STATION

This Dispensing Test Station (DTS) project focuses on designing a universal test system for the functional testing of various PCBAs and sub-assemblies in an automatic dispensing cabinet product line. It includes a dedicated Printed Circuit Board Assembly (PCBA) to verify DTS operation, ensuring accurate performance checks. The DTS assembly features a custom fixture, panel, and cabinet, making it a reliable tool for production testing. This project enhances quality assurance by streamlining the verification process of product components, improving efficiency in manufacturing.



**Youtube Video:** <https://youtu.be/SACNEAaucI0>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-09.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-09.pdf)

LiON Power



MEMBERS

Sarah Mellado  
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Brian Pham  
James Burns  
Ibrahim Bukhari

ADVISORS

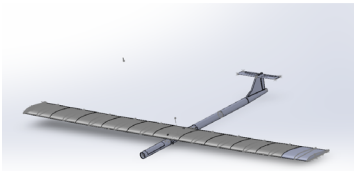
**SDSU**  
Dr. Lingping Kong  
Dr. Scott Shaffar

RATIONAL DESIGN OF BIPOLAR STACKING LI-O2 BATTERIES WITH ULTRAHIGH ENERGY DENSITY FOR AVIATION APPLICATIONS

The project focused on five key aspects to develop a battery capable of powering a drone. Building on an existing solid-state lithium-oxygen battery from the sponsor's research lab, modifications aimed to enhance power output. A specialized chamber was designed to analyze battery materials efficiently. Optimization efforts included refining the cathode structure, solid electrolyte, and microporous activation site while ensuring proper electrochemical ratios and preventing cross-interactions.

**Youtube Video:** <https://www.youtube.com/watch?v=NMe3Rn0vQhE>  
**Poster:** [https://mechanical.sdsu.edu/design-day/\\_files/2025/poster20.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/poster20.pdf)

Mach-3D



MEMBERS

Noah Richards  
Tyler De Silva  
Yumi Kawata  
Jonathan Guerrero  
Sukhbir Randhawa

ADVISORS

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INDEPENDENT  
Dr. Charles Norris

CALIFORNIA 3D PRINTED AIRCRAFT COMPETITION (C-3DPAC)

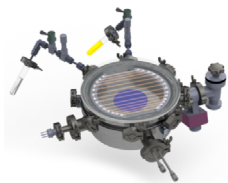
The California 3D Printed Aircraft Competition (C-3DPAC) challenges teams to design, build, and fly a remote-controlled aircraft with significant 3D-printed components. Emphasizing innovation, aerodynamics, and additive manufacturing, teams must optimize weight, strength, and design to excel within competition constraints. Aircraft undergo design reviews, flight tests, and performance evaluations, including the core trial of longest flight time. The competition fosters engineering skills, teamwork, and practical application of additive manufacturing and design.

Youtube Video: <https://www.youtube.com/watch?v=QOU7BeHcgro>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project14.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project14.pdf)

SDSU

Student  
Success Fee

MINOTORR



MEMBERS

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Jonathan Jazo  
Junichi Suda  
Jonathan Jordan

ADVISORS

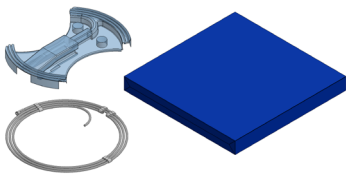
SDSU  
Dr. Meysam Heydari Gharahcheshmeh  
Dr. Scott Shaffar

Manufacturing of Initiative Chemical Vapor Deposition (iCVD) Reactor for Manufacturing Functional Polymers

The iCVD reactor is designed for manufacturing functional polymers for biomedical applications. Students will manufacture and redesign the vacuum reactor, including connecting various components such as delivery lines, heated tapes, pressure transducers, valves, and temperature/pressure controllers. Students will utilize a control box to monitor and regulate the process during vacuum deposition. The vacuum chamber, connected to an oil pump, will reach and maintain a base pressure to ensure a robust vacuum environment.

Youtube Video: <https://www.youtube.com/watch?v=u6PAWn-1LYo>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/29-project29-design-day-poster.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/29-project29-design-day-poster.pdf)

PulsePak



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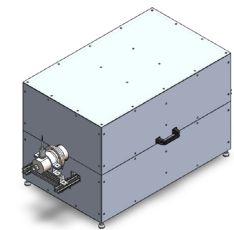
SUSTAINABLE PACKAGING REDESIGN FOR INTRAVASCULAR CARDIAC MEDICAL DEVICES

Philips Image Guided Therapy Devices excels in intravascular imaging and functional measurement tools for cardiac catheterization labs that enhance clinical decision-making. This project focuses on redesigning the packaging to reduce single-use plastic, incorporate recycled materials, and enable recycling in labs. It must maintain sterility, usability, and compliance while withstanding transport and extreme conditions. Standardization across devices is key, ensuring sustainability and efficiency while maintaining workflow in medical environments.

Youtube Video: <https://youtu.be/O7rt6U0doCk>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project23.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project23.pdf)

PHILIPS

Sinter Spin



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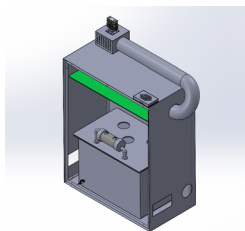
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ROTATIONAL SINTERING FURNACE

The Rotational Sintering Furnace project aims to design, build, and test a sintering furnace capable of horizontal rotation to mitigate gravity-induced distortions. At high temperatures, low material viscosity causes uneven deformations, leading to costly part rejection. By rotating at controlled speeds up to 1 RPM, the furnace evenly distributes gravitational forces, enabling uniform sintering of materials at up to 1700. This project explores a novel technique for reducing gravity-induced distortions, improving part quality and expanding sintering capabilities.

Youtube Video: <https://www.youtube.com/watch?v=sXET7gRkCiw>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project28.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project28.pdf)

Sprout



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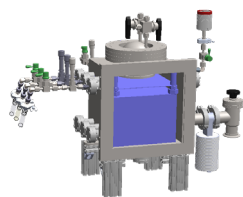
MICRO-ENVIRONMENT MANAGEMENT SYSTEM

The Micro-Environment Management System (MMS) is an advanced cultivation platform that seamlessly integrates temperature, humidity, light, and nutrient control with an automated hydroponics system. Designed for precision and efficiency, its interconnected subsystems work in unison through a sensor-driven feedback loop, dynamically adapting to environmental conditions in real time. MMS represents a cutting-edge solution for controlled environments, offering a powerful tool for advancing agricultural research and driving innovation in sustainable cultivation.

Alan Reyes

Youtube Video: <https://youtu.be/-mP83mOebio>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project26.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project26.pdf)

Team COMET



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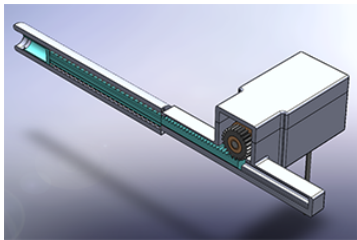
Assembly of oCVD Reactor for Conducting Polymers

The oxidative Chemical Vapor Deposition (oCVD) reactor is constructed by designing delivery lines with ball and needle valves and a vacuum system consisting of a roughing valve, throttle valve, pressure transducer, and vacuum pump. Multiple heating tapes, temperature controllers, and a solid-state relay must be precisely tuned via the PID control box. The oxidant and monomer are heated into gases and enter the vacuum chamber. Once fully designed and fabricated, the system enables the controlled manufacturing of conducting polymers under stable process conditions.

Youtube Video: <https://www.youtube.com/watch?v=0gj-zjGJ9kA>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-30-design-day-poster.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-30-design-day-poster.pdf)



Team FISH (Fishing Innovations for Service Heroes)



MEMBERS

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Max Brown

ADVISORS

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QUALITY OF LIFE PLUS  
Scott Huyvaert

HANDHELD FISHING LAUNCHER FOR DISABLED VETERANS

This project was sponsored by Quality of Life Plus (QL+), in collaboration with River Deep Foundation and Craig Hospital. QL+ is a national nonprofit that develops customized engineering solutions for veterans and first responders. Team FISH was tasked with creating an adaptive fishing device for incomplete-quadruplegic veterans. The multicomponent device assists with safely casting and retrieving lures, rigs, and fish with minimal physical strain, enhancing their fishing experience and allowing more independence.



Youtube Video: <https://www.youtube.com/watch?v=w8ed1RUVrc>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project-22.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project-22.pdf)

Team STORM



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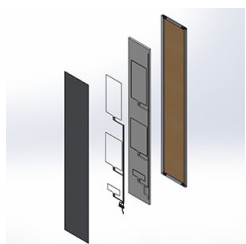
SEMI-ACTIVE LONG TRAVEL SUSPENSION FOR OFF-ROAD RACING

Utilizing commercially available coil over dampers provided by FOX racing, custom electronics, and computer aided design; the team will design, build, and test new suspension components to deliver a complete suspension system. This suspension system will be a direct drop-in upgrade for the 2023-2025 SAE Baja car.



Youtube Video: [https://youtu.be/Hz4xkZ26YT0?si=UEPz9hmMr3vVQ5\\_u](https://youtu.be/Hz4xkZ26YT0?si=UEPz9hmMr3vVQ5_u)  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project16.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project16.pdf)

Tec-Tenna



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RECREATIONAL VEHICLE CONFORMING TV ANTENNA

RV owners have expressed the desire for a reliable over-the-air (OTA) TV solution, but current options are prone to damage, theft, and high maintenance costs. Existing systems require vehicle modifications that increase long-term upkeep. This project aims to develop an integrated OTA antenna system for new RVs, offering durable, high-quality signal reception regardless of orientation. The project will deliver a working prototype and detailed documentation addressing signal optimization and integration challenges.

Youtube Video: <https://youtu.be/rpDhk39hE7w>  
Poster: [https://mechanical.sdsu.edu/design-day/\\_files/2025/project25.pdf](https://mechanical.sdsu.edu/design-day/_files/2025/project25.pdf)