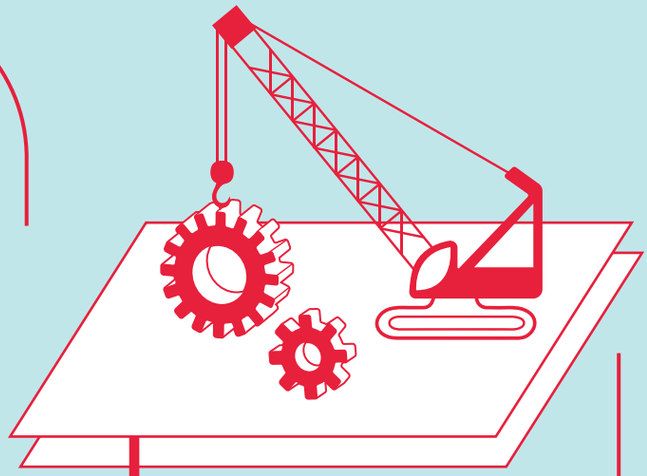

SENIOR DESIGN DAY '26

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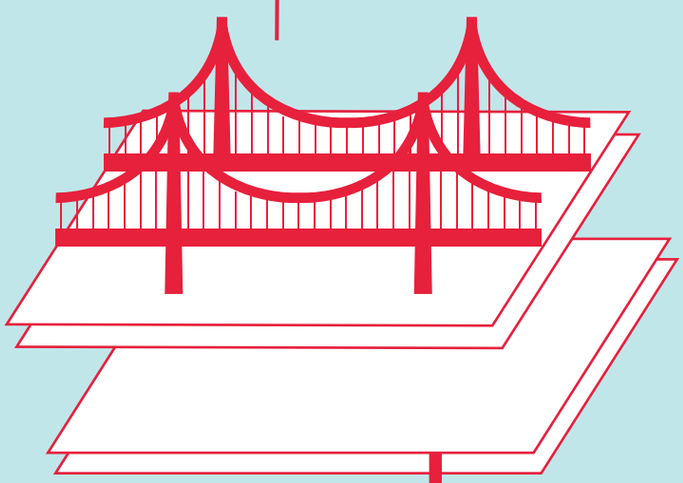

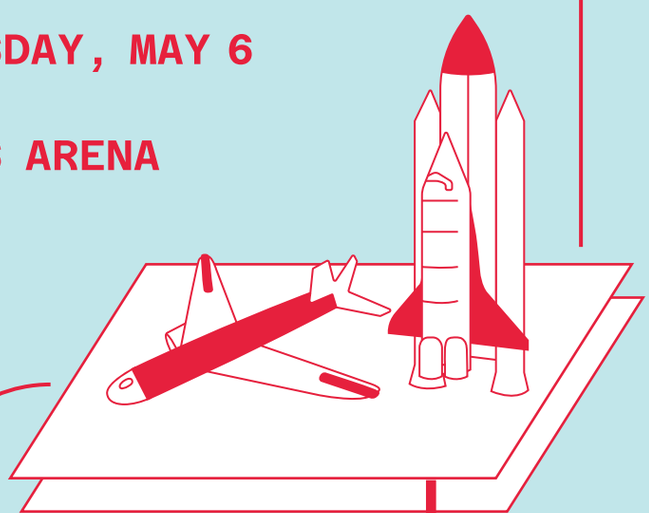

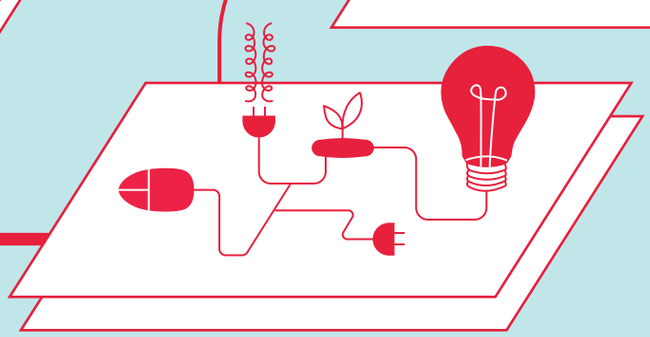

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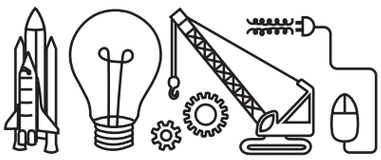

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Barrelborne – ***Wing in Ground Effect RC Plane***
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PIV Patrol – ***Visual Anemometry***
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SDSU Smoke Rake – ***SDSU Smoke Rake***
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Sleipnir – ***Sleipnir - Conceptual Supersonic Business Jet Design***

Vertical and Horizontal Tail Design for Fighter Aircraft – ***Vertical Stabilizer Design for Fighter Aircraft***
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Sponsored by Naval Information Warfare Center Pacific

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Sponsored by SDSU Mechanical Engineering

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Sponsored by General Atomics Aeronautical Systems

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Sponsored by SDSU Mechanical Engineering's FIAMMA Lab

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Sponsored by SDSU Mechanical Engineering's Powder Technology Lab

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Sponsored by SDSU Civil, Construction and Environmental Engineering

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Sponsored by SDSU Mechanical Engineering

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Sponsored by Solar Turbines

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Sponsored by Solar Turbines

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Sponsored by SDSU Mechanical Engineering

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Sponsored by General Atomics Electromagnetic Systems Group

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Sponsored by Naval Information Warfare Center

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Sponsored by General Dynamics Ordnance and Tactical Systems

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Sponsored by San Diego Zoo Wildlife Alliance

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Sponsored by General Atomics Aeronautical Systems

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Sponsored by SDSU Mechanical Engineering and SDSU Aerospace Engineering

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Welcome to the SDSU College of Engineering's Spring 2026 Senior Design Day at Viejas Arena.

We are delighted to gather with you as our graduating seniors present the projects they have imagined, developed, and realized during the 2025–26 academic year. These capstone experiences represent the culmination of our students' undergraduate education and highlight work from Senior Design courses in Aerospace Engineering, Civil, Construction and Environmental Engineering, Electrical and Computer Engineering, and Mechanical Engineering.

I extend my congratulations to our student teams for their exceptional accomplishments. Their projects demonstrate not only strong technical preparation, but also creativity, teamwork, and perseverance. Through this immersive design experience, students strengthen their ability to solve complex, real-world problems, integrate human and societal considerations, and deliver thoughtful engineering solutions. These skills form a strong foundation for their transition into professional engineering careers.

We are sincerely thankful to our industry and community partners whose generous support makes Senior Design Day possible. Our sponsors play a vital role in enriching the educational experience by providing resources, expertise, and real-world perspectives that elevate the quality and impact of our students' work.

Many of our sponsors are directly engaged with the student teams, offering mentorship and guidance throughout the year. Their involvement is invaluable, and we deeply appreciate their commitment to supporting our students and investing in the future of the engineering profession.

Thank you for joining us for this important celebration of student achievement. We hope you enjoy SDSU's Spring 2026 College of Engineering Senior Design Day and leave inspired by the innovation, dedication, and talent of our graduating seniors.



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

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PTLab

PVA
Paralyzed Veterans of America
Cal-Diego Chapter

RON FLETCHER REAL ESTATE

San Diego Zoo Wildlife Alliance

CIVIL SPORTS DESIGNER

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SDSU YANG LAB
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San Diego State University
ROCKET PROJECT

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2026 SENIOR DESIGN DAY

FACULTY

Aerospace Engineering



Ahmad Bani Younes, Ph.D., Associate Professor

abaniyounes@sdsu.edu

Dr. Bani Younes has a broad range of research interests in the areas of astrodynamics, autonomous aerial systems, unmanned aerial vehicles (UAVs), guidance, navigation, and control (GNC), vision-based navigation, and AI-driven autonomy. His work focuses on UAV path planning, obstacle avoidance, multi-agent coordination, and real-time embedded systems. Additional interests include space systems modeling, satellite orbit determination, robotics, and experimental validation of autonomous platforms for aerospace and defense applications.



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 of Aeronautics 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

Professor 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.

Civil, Construction & Environmental Engineering



Mark Filanc, PE, Lecturer

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 a past chairman and current member of DBIA's Water Committee, past President of the San Diego Chapter of 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

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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 American Public Works Association (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

Paul Jackson is a Program Manager in SDSU's Planning, Design, and Construction Department and has spent the last 7 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 Calexico 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!



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

jprince@delanegroup.com

Mr. Prince is Co-Owner/Vice President of DELANE Engineering with over 25 years of Site Civil Engineering and Site BIM Experience. John has been teaching at SDSU for over 14 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.



Kyle Schellenger, PE, SE, KPFF Consulting Engineers, Associate/Structural Project Manager

kschellenger@sdsu.edu

Kyle is an Associate and Structural Project Manager at KPFF Consulting Engineers, contributing to some of the firm's most complex projects, including performance-based design high-rise buildings. His work blends innovative engineering solutions with high-quality deliverables, with notable projects including the India and Grape Residential Development, Fairmont Manchester San Diego, IQHQ Block 2B, Oceanside Beachfront Resort, and the CSU San Marcos North City Block F student housing.

Electrical & Computer Engineering



Christopher Paolini, Ph.D., Associate Professor

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Dr. Christopher Paolini is Director of the SDSU Internet of Things Laboratory and an Associate Professor in the Department of Electrical and Computer Engineering. Chris is the recipient of grants from the Department of Energy (DoE), NASA, California Highway Patrol (CHP), Office of Naval Research (ONR), Department of Transportation (DoT), National Institute on Minority Health and Health Disparities in the National Institutes of Health (NIMHHD/NIH), National Science Foundation (NSF), and Lawrence Berkeley National Laboratory. Chris' doctoral and post-doctoral research has been in the areas of computational geochemistry, combustion engineering, computational thermodynamics, and chemical kinetics. Christopher Paolini's current research interests include mmWave antenna fabrication, computational geochemistry, high performance computing, numerical chemical thermodynamics, scientific computing and numerical modeling, numerical chemical kinetics, Internet of Things device development, machine- and deep-learning, embedded systems, cloud computing, big data analytics, software engineering, high speed (≥100 Gbps) networking, cyberinfrastructure development, and cybersecurity.

Mechanical Engineering



Scott Shaffar, Ph.D., Lecturer

sshaffar@sdsu.edu

Dr. Scott 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.







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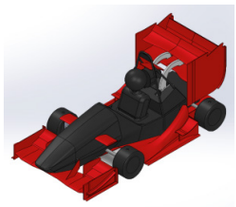
AEROSPACE ENGINEERING

AER Wind Tunnel Study



AER WIND TUNNEL STUDY

We validated current AER CFD and provided them with pressure distribution through experimental methods. We then created our own aerodynamics package (front wing / rear wing) to directly compare using lessons learned through design philosophy and experimental testing of AER-26. The main goal of this study is to provide AER with valuable information about their race vehicle's aerodynamics design to be compared to the results obtained during live testing trials. The main learning objective is race car aerodynamics design and using CFD.

Youtube Video: https://youtu.be/fwMGT-jL0q8

Poster: https://aerospace.sdsu.edu/design-day/files/2026/aer_wind_tunnel_ae.pdf

MEMBERS

Matthew Sciascia
Anthony Lopez
Anthony Pena Barerra
Riku Okubo

ADVISORS

SDSU
Dr. Roni Goldshmid
Dr. Joseph Katz

SDSU College of Engineering Aerospace Engineering

Aleborne

2025-2026 NEXT GENERATION CARRIER-BASED STRIKE FIGHTER CONCEPT

7-person team designing a next-generation carrier-based strike fighter concept responding to the 2025–2026 Navy RFP for AIAA Competition. It is meant to achieve a 700 nmi combat radius with internal weapons carriage for survivability, TRL 6+ subsystems, and 25-year maritime durability, with other constraints. Validated CVN-68/CVN-78 compatibility (catapult launch, arrested recovery, deck/hangar limits) and sized air-to-air and precision-strike payloads while iterating on remaining dash/turn performance targets.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/aleborne_poster.pdf

MEMBERS

Maxwell O'Neill
Ethan Barichievich
Luke Horton
Benjamin Torres
Ian Plant
Bryce Sullins
William Peterson

ADVISORS

SDSU
Mr. Geoffrey Butler

ANCS

FIN-CONTROLLED, WAYPOINT-GUIDED ROCKET

The objective of this project is to design, build, and launch a fin-controlled rocket to guide itself autonomously towards a weather balloon. The entire project has been built from scratch; custom PCB and electronics, custom code and flight control software, and custom body and moving parts. We've successfully built, simulated, and launched the rocket many times.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/ancs.pdf

MEMBERS

Jeffery Schroeder
Jared Maestri
Logan Smith
Clement Colwell
Mika Nash
Tlalli Urbano

ADVISORS

SDSU
Dr. Roni Goldshmid

SDSU College of Engineering Aerospace Engineering

Andromeda SpaceWorks

HIGH-POWERED SOLAR ELECTRICALLY PROPELLED (HPSEP) SPACE TUG

The High-Powered Solar Electric Propulsion (HPSEP) space tug is a reusable cislunar transport vehicle designed to move cargo between Earth and lunar orbit using high-efficiency Hall thrusters, roll-out solar arrays, and on-orbit refueling. To represent one of its critical subsystems, we built a reaction-wheel prototype that demonstrates how the tug maintains precise altitude during long-duration thrusting, docking, and solar-array tracking. Our prototype showcases the ADCS principles that keep the full-scale HPSEP tug stable and mission-ready.

Youtube Video: https://youtu.be/EEx1kiHacXQ

Poster: https://aerospace.sdsu.edu/design-day/files/2026/andromeda_spaceworks_poster.pdf

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Bang-Bang Baddies

BANG-BANG PRESSURE REGULATION SYSTEM

The Bang-Bang Baddies are tasked with designing a bang-bang pressure regulation system for SDSU Rocket Project. To maintain a stable engine burn, the pressure in the propellant tanks must be held constant by regulating the flow of nitrogen from the pressurant tank. Our team is building out a system, that uses three electrically actuated solenoid valves to regulate a constant outlet pressure. By opening and closing in response to pressure changes, the valves will maintain tank pressure within a 10 psi band throughout operations.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/bang_bang_baddies_poster.pdf

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Barrelborne

WING IN GROUND EFFECT RC PLANE

OverrideX's WIG RC prototype is a Boeing Pelican inspired wing in ground effect aircraft designed to exploit the lift and efficiency gains that occur when flying just above water, where wingtip vortices and downwash are reduced and induced drag drops. The vehicle can achieve longer endurance and higher payload efficiency than a conventional RC aircraft at the same power. The program integrates retractable footpods to get the aircraft at the appropriate ride height.

Youtube Video: https://www.youtube.com/shorts/zbi3fPpUhOI

Poster: https://aerospace.sdsu.edu/design-day/files/2026/barrelborne_ae_poster.pdf

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Condor Drones

EFFICIENT MEDICAL DELIVERY DRONE

A blended wing drone engineered to maximize range and speed, enabling rapid medical delivery to remote and rural communities. Its low-drag aerodynamic design supports longer missions and lower production cost when compared to traditional aircraft designs. Our product will yield reliable access to medical supplies transport where infrastructure is limited or emergencies demand rapid response.

Youtube Video: https://www.youtube.com/watch?v=EE1pbydPpYA

Poster: https://aerospace.sdsu.edu/design-day/files/2026/condor_drones.pdf

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CryoLuna

CRYOLUNA, LUNAR ICE DETECTION SATELLITE

CryoLuna is a lunar satellite whose mission objective is to analyze the lunar poles to determine the quantity of ice beneath the lunar surface. These ice deposits are crucial for future lunar missions as the lunar ice can provide hydrogen and oxygen for life support systems for manned missions. This hydrogen and oxygen can also be repurposed into rocket fuel for missions into deep space.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/lids_poster_aerospace_engineering.pdf

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Delta Divas

DIVANET MARS COMMUNICATION NETWORK

Future large scale exploration of Mars is limited by a lack of existing communications infrastructure. This project develops a near-term solution to this issue through a 12-satellite constellation providing surface to surface and surface to Earth capabilities for the entirety of Mars. Using a novel inclination-changing aerocapture maneuver to save fuel and provide greater surface communications coverage, this constellation was designed to launch on a single Falcon Heavy rocket.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/divas_poster.pdf

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Destiny

DESTINY

Our senior design project developed a conceptual mission architecture to utilize the Solar Gravitational Lens (SGL) for high-resolution imaging of a potentially habitable exoplanet. The spacecraft employs advanced propulsion and thermal protection strategies to travel beyond 550 AU, where the Sun's gravity acts as a natural telescope. The design integrates propulsion, thermal control, structural, communications, and payload subsystems to evaluate feasibility, performance margins, and mission scalability.

Youtube Video: https://www.youtube.com/watch?v=OZTh6yZOad4

Poster: https://aerospace.sdsu.edu/design-day/files/2026/destiny_ae_poster.pdf

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Elite Ball Knowledge

BASEBALL AVOIDANCE MULTIROTOR (BAM)

Open-source NASA Langley Research Center challenge project, with the aim to demonstrate the ability for a quad-rotor to autonomously avoid baseballs on collision courses (in real time). The project is simulation-based using the Monte Carlo method, MATLAB/Simulink, C++, Python, Unreal Engine 5, and other robotics and simulation software. The final program is ready-to-port to off-the-shelf quad-rotor drones.

Youtube Video:

Poster:

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NASA Langley Research Center (LaRC)

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Ember Eye



HYBRID-MANUFACTURED FIXED-WING UAV FOR COASTAL / FIRE SEARCH AND RESCUE

Ember Eye is a light-weight, long-endurance fixed-wing UAV for search and rescue and wildfire detection. It comes equipped with a thermal imaging camera that detects the heat signatures of missing persons and hotspots of emerging wildfires in coastal and wilderness areas. Constructed from a carbon fiber internal frame and 3D-printed parts, Ember Eye is an affordable, easy-to-assemble UAV suitable for first responders.

Youtube Video: https://www.youtube.com/watch?v=YqPBLtAWFCc&feature=youtu.be

Poster: https://aerospace.sdsu.edu/design-day/files/2026/ember_eye_poster.pdf

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Ethereal

NEXT GENERATION CARRIER-BASED STRIKE FIGHTER AIRCRAFT

This project proposes a next-generation, carrier-based strike fighter optimized for a 2035 Initial Operational Capability TRL greater than 6, and in production components. Utilizing a canard configuration to achieve superior low-speed handling and reduced stall velocities, the design ensures rigorous carrier suitability for CVN-68/78 operations. An all-internal weapons bay minimizes radar cross-section during high-stakes missions, including 700nm radius air-to-air combat and sea-level strike sorties. The platform delivers high-performance lethality while breaking historical cost-growth trends.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/ethereal_poster.pdf

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Firewall

PORTABLE WIND SHAPER

The goal of this project is to design and manufacture a 3x3 ft portable wind shaper that is fitted with fans and able to generate various wind speeds for open-air testing. This system aims to create a realistic testing environment for research in aerial firefighting and drop dispersion under intense wind conditions.

Youtube Video:

Poster:

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Laika Aerospace

EUROPA LANDER MISSION

The Europa Lander Mission is a conceptual aerospace systems design focused on delivering a stationary scientific lander to the surface of Jupiter's moon Europa. The project addresses extreme radiation, low solar flux, and cryogenic thermal conditions through integrated power, thermal, communications, structures, and avionics subsystems. As part of the project, the team will design and present a representative mission subsystem or scaled prototype to demonstrate key engineering trades and system level performance.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/laika_ae_poster.pdf

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SPACE SDSU

PIV Patrol



VISUAL ANEMOMETRY

Visual Anemometry infers flow speed and direction from visual motion of structures and flow-structure interaction physics. This project seeks to find the boundary conditions of visual anemometry as a tool and demonstrate it in water to assess how different fluid properties influence motion-flow relationships relative to air.

Youtube Video:

Poster:

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Project Gridlock V2



PROJECT GRIDLOCK V2

Gridlock V2 continues the original Project GridLock research by building on the unihex grid fin geometry identified as the strongest performer. The original project examined various grid fin geometries to identify relationships between geometric parameters and grid fin performance. This project focuses on refining that proven baseline through targeted modifications such as chamfers and serrations, rather than introducing entirely new grid patterns. All variants will be 3D printed and tested in the SDSU subsonic wind tunnel across multiple freestream speeds and angles of attack to compare lift, drag, moment, and overall efficiency.

Youtube Video:

Poster:

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SDSU Smoke Rake



SDSU SMOKE RAKE

We built a smoke visualization system to replace the current method inside the SDSU low speed wind tunnel lab. The project includes a controlled smoke generator, a transverse motion rig, and a smoke rake. This improves upon the current method in use by having the smoke generation be in a closed tunnel setting and able to project smoke on every part of the model without stopping the tunnel and adjusting.

Youtube Video:

Poster:

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GENERAL ATOMICS AERONAUTICAL

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Sleipnir

SLEIPNIR - CONCEPTUAL SUPERSONIC BUSINESS JET DESIGN

Sleipnir is a conceptual supersonic business jet designed to transport up to 10 passengers at speeds of Mach 2. The proposed aircraft has a maximum takeoff weight of 130,000 pounds and features a delta wing configuration with twin engines. This project aims to optimize aerodynamic performance, propulsion integration, and overall efficiency to support the reintroduction of supersonic business travel into the commercial aviation market.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/sleipnir.pdf

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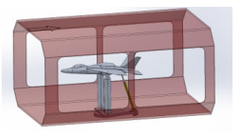
Vertical and Horizontal Tail Design for Fighter Aircraft



VERTICAL STABILIZER DESIGN FOR FIGHTER AIRCRAFT

Wind Tunnel and CFD data analysis of six different tail configurations for a fighter style aircraft to reduce size, while maintaining pitch and yaw stability. A 3-D model was created as a reference body, and then six different tails were created to be quickly removed and replaced for systematic testing. The traditional, single vertical stabilizer and horizontal stabilizer tail design was created as the baseline to show the changes in pitching and yawing moments with the five other tail models.

Youtube Video: https://youtu.be/2ZPon6pl7Tc

Poster: https://aerospace.sdsu.edu/design-day/files/2026/vertical_and_horizontal_tail_design_poster.pdf

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GENERAL ATOMICS AERONAUTICAL

SDSU College of Engineering Aerospace Engineering

VTOL UAV



VTOL UAV

The objective of this project is to design a VTOL UAV. The aircraft performs vertical takeoff and landing while achieving efficient forward flight. The goal was to develop a feasible VTOL configuration that meets mission requirements for range and overall endurance, with a primary emphasis on optimizing the transition from vertical takeoff/hover to level flight, where significant energy losses occur, while balancing performance, mass, and system complexity.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/vtol.pdf

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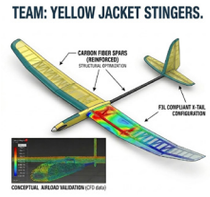
Yellow Jacket Stingers



YELLOW JACKET RC GLIDER OPTIMIZATION

Team Yellow Jacket Stingers are optimizing the flight performance of the F3L-class Yellow Jacket RC glider for competition readiness. Utilizing Computational Fluid Dynamics and Finite Element Analysis, we are redesigning the aircraft architecture and implementing new structural features to enhance stability and control under extreme wind conditions. Our engineering workflow validates these optimizations through rigorous simulation and flight testing, ensuring peak performance for the May 2026 F3L-style event.

Youtube Video:

Poster: https://aerospace.sdsu.edu/design-day/files/2026/yellowjacketstingers_poster.pdf

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TORREY PINES GULLS

CIVIL, CONSTRUCTION, & ENVIRONMENTAL ENGINEERNIG

Altus Consultants

HOLLAND STREET PEDESTRIAN BRIDGE OVER ERIE BAYFRONT PARKWAY

Altus Consultants are proud to engineer the Erie Bayfront Pedestrian Bridge, located in Erie Pennsylvania. We are working on the design and scheduling of the bridge, giving a professional and unique strategy on how to construct this bridge. With us, we satisfy a Disadvantaged Business, fulfilling the requirement per state guidelines, making us invaluable to this operation. Some challenges that have been brought to us are the geotechnical aspects, with the very soft soil in Erie. We are proud though to come up with unique strategies and bring a bridge to the locals.

Youtube Video: https://www.youtube.com/watch?v=4EMjco9JNIM

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team5_altus-consultants_sp26.pdf

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Anchor Point Engineering

HOLLAND STREET PEDESTRIAN BRIDGE OVER ERIE BAYFRONT PARKWAY

The Holland Street Pedestrian Bridge project proposes the design and addition of a shared use path and bridge spanning Erie Bayfront Parkway to provide safe and efficient pedestrian and cyclist access to the Bayfront district. The project includes structural bridge design, ADA compliant path alignments, grading, and stormwater improvements. By improving safety and accessibility, the project will better connect the community and the Bayfront district.

Youtube Video: https://www.youtube.com/shorts/gE_5DPTth3o

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team7_anchor-point-engineering_sp26.pdf

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Anduin Engineering

MT RIDGEVIEW DRAINAGE IMPROVEMENTS

We've been tasked with implementing a new drainage system that addresses erosion issues, aging storm drain infrastructure, and localized pavement damage. We are proposing to upsize the current piping to increase capacity and reduce any clogging, install erosion control measures such as riprap to reduce erosion, and reconstruct the swale to allow more control of the flow speed, as well as more control of the direction the water flows. Overall, improving the sustainability of the community.

Youtube Video: https://www.youtube.com/shorts/2YpA5507ahI

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team14_anduin-engineering_sp26.pdf

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AquaPure Systems

ENCINITAS COMMUNITY PARK STORMWATER CAPTURE AND REUSE

This project proposes the design of an on-site stormwater capture and storage system to supplement reclaimed water currently being used for park irrigation. Collected rainwater, runoff, and greywater will undergo a multi-stage treatment train to meet California non-potable reuse standards. The system will incorporate collection infrastructure, piping, pumps, filtration, disinfection, and storage facilities to increase water sustainability. This will reduce reliance on imported water, and improve long term drought resilience.

Youtube Video: https://www.youtube.com/watch?v=34Vc6cQk-3k

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team17_aquapure-systems_sp26.pdf

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ATLAS Engineering

HOLLAND STREET PEDESTRIAN BRIDGE OVER ERIE BAYFRONT PARKWAY

The Holland Street Pedestrian Bridge is designed to provide safe and reliable pedestrian and bicycle access over the Erie Bayfront Parkway. The bridge serves as a community landmark to link recreational areas, residential neighborhoods, and tourist attractions, while encouraging walking, cycling, and social engagement. The design will thoroughly balance vertical clearance requirements while being Americans with Disabilities Act (ADA) accessible and integrating bike paths. This creates an aesthetic structure that meets all relevant codes for structural integrity and will further connect the surrounding community.

Youtube Video: https://www.youtube.com/watch?v=KRIqmEgQCL0

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team6_atlas-engineering_sp26.pdf

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Big Wedge Engineering

HARBOR ISLAND POLICE HEADQUARTERS

The project consists of building a modern 80,000ft^2 Harbor Police Headquarters (HPHQ) next to the existing HPHQ. We will be raising the elevation of the HPHQ to be proactive about sea level rising. The current HPHQ will be demolished after the construction of the new building and we will build a multilevel parking structure footprint of the old HPHQ.

Youtube Video: https://www.youtube.com/shorts/82aoeZbE10E

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team10_big-wedge-engineering_sp26.pdf

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BnL Construction

5451 MEDICAL OFFICE BUILDING

Located in La Jolla, CA, this 20,000 SF tenant improvement project focuses on elevating the patient experience through modernized clinical and staff environments. BnL is managing the full project lifecycle, including seismic retrofitting, infrastructure improvements, and exterior landscaping. Our team ensures project success through rigorous site logistics, safety planning, and document management.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team1_conm_bnl-construction_sp26.pdf

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Paul Jackson, DBIA

Align Builders

ContourX Engineering Solutions

MOUNT RIDGEVIEW DRAINAGE IMPROVEMENTS

The Mt. Ridgeview Drainage Improvements Project involves the engineering design of upgraded storm drain culverts, swale reconstruction, and roadway repairs along Ridgeview Road and Ridgeview Lane in Ramona, CA. The project replaces four deteriorated corrugated metal pipes, stabilizes erosion-prone areas, and reconstructs damaged pavement sections to restore proper stormwater conveyance and roadway integrity. Improvements will enhance public safety, infrastructure resilience, and long-term sustainability in compliance with County standards.

Youtube Video: https://www.youtube.com/watch?v=o-8us3ku5TQ

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team15_contourx-engineering-solutions_sp26.pdf

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Datum Engineering

BEALE AIR FORCE BASE DAM AND CHANNEL DESIGN PROJECT

Our company is facilitating the redesign of an existing open channel on Beale Air Force Base to address flood control issues by accommodating a potential 500-year storm event. The scope includes hydrologic analysis, hydraulic modeling, preliminary grading, erosion control and SWPPP planning, as well as creating a construction and logistics plan.

Youtube Video: https://www.youtube.com/watch?v=gSsmhbMxJAw

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team8_datum-engineering_sp26.pdf

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CVALDO CORPORATION
CIVIL ENGINEERING

Farmstead Construction



MICROFILTRATION (MF) / REVERSE OSMOSIS (RO) FACILITY FOR AGRICULTURE

The new project Farmstead Construction is embarking on is the Microfiltration (MF) / Reverse Osmosis (RO) Facility for Agriculture, located in the city of Escondido. The project scope consists of a 30,000 square foot metal building which houses the MF/RO water treatment systems, two bolted steel storage tanks, and approximately one mile of underground pipeline for water distribution. This facility is designed to treat up to 4 million gallons of reclaimed water per day.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team2_conm_farmstead-construction_sp26.pdf

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FILANC

Flow State Engineering (Batiquitos)

BATIQUITOS PUMP STATION REHABILITATION

The Batiquitos Pump Station Rehabilitation project focuses on improving the reliability and resilience of a critical coastal wastewater facility serving Encinitas and the Leucadia Wastewater District. Our scope includes pump and force main optimization, odor control improvements, flood mitigation, and site civil upgrades, with an emphasis on maintaining operations, addressing coastal constraints, and developing sustainable, cost effective solutions.

Youtube Video: https://www.youtube.com/shorts/pVQzCdcyJR8

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team20_flow-state-engineering-batiquitos_sp26.pdf

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ADVISORS

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Flow State Engineering (Beale AFB)

BEALE AIR FORCE BASE DAM AND CHANNEL DESIGN PROJECT

Flow State Engineering (FSE) is proud to present our project proposal to provide engineering design services for the Beale Air Force Base Dam and Channeling Design project located in Yuba County, CA. This project involves the removal and reconstruction of an existing flood control dam at Frisky Lake and the design of the open channel. The FSE team will evaluate, design and propose improvements that mitigate flood risk while meeting all project constraints, sustainability goals and applicable engineering standards.

Youtube Video: https://www.youtube.com/watch?v=WnJ-DTHHRSI

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team9_flow-state-engineering-beale-afb-sp26.pdf

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CVALDO CORPORATION
CIVIL ENGINEERING

HDJZ Engineering

SDSU SPORTS DECK

Engineering and design of a parking deck with a recreational space for students. Using the existing Sports Deck at Montezuma and 55th as a model, the plan identifies an optimal site for a multi-level parking structure topped with accessible green space. Site selection and design carefully considers topography, circulation, access points, and integration with existing campus infrastructure.

Youtube Video: https://youtu.be/YixBpYlmAEc

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team1_hdjz-engineering_sp26.pdf

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Dr. Julio Valdes

HK Builders

AZTEC STADIUM

The Aztec Stadium project is a modern stadium built in Mission Valley that replaced Qualcomm Stadium. This design-build project consists of a 35,000-seat multi-use outdoor venue owned by San Diego State. This venue will be a multipurpose stadium for all types of San Diego events and is integral to the Mission Valley redevelopment vision. The project is roughly 30,000 cubic yards of concrete supporting around 2,500 steel beams that shape the stadium frame. The total budget for this project is $413.5M.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team3_conm_hkbuilders_sp26.pdf

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Hydrocore Builders

LAKE HODGES DAM REPLACEMENT

Lake Hodges was created to store water for potable purposes and is owned by the city of San Diego, serving northern portions of the city of San Diego. The dam has degraded due to environmental element exposure. The project consists of an evaluation of all the existing conditions and specifications of the new dam and preparation of a preliminary design for the new RCC dam immediately downstream with a spillway height to match the existing spillway height at elevation of 315 ft.

Youtube Video: https://www.youtube.com/watch?v=88QlJekx7SU

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team21_hydrocore-builders_sp26.pdf

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JAIN Builders

SOUTHWESTERN COLLEGE STUDENT UNION



The Southwestern College Student Union Project is a nearly 70,000-sq-ft higher-education facility designed to serve as the central hub of campus life. It will host a wide range of events, including student chapter meetings, club activities, social gatherings, and academic functions for the entire student body. The two-story building features diverse program spaces, from commercial kitchens with walk-in freezers and refrigerators to large ballrooms capable of accommodating events with attendance in the thousands.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team4_conm_jain-builders_sp26.pdf

MEMBERS

James Buchans
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ADVISORS

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Paul Jackson, DBIA

Balfour Beatty

Keystone Engineering

LAKE HODGES DAM REPLACEMENT

The existing dam is a multiple arch dam with an ogee weir spillway, standing 131-feet high. Over time, environmental exposure has degraded the structure, requiring its replacement. Additionally, the dam was not designed for a major earthquake and currently operates at a lower capacity due to restrictions imposed by the California Department of Safety of Dams. The project consists of the construction of a new roller-compacted concrete dam, approximately 100 feet downstream of the existing dam, matching the current spillway elevation.

Youtube Video: https://www.youtube.com/watch?v=WCvslOww_TI

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team22_keystone-engineering_sp26.pdf

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Dr. Panagiotis Mitropoulos
Dr. Julio Valdez
Thomas Zink

BLACK & VEATCH

Laminar Engineering

SAN CARLOS RESERVOIR REPLACEMENT

LAMINAR ENGINEERING

The proposed San Carlos Reservoir replacement encompasses a new 3.3 million gallon reservoir designed to AWWA D110 standards. Additionally, the plans include a new chloramine treatment process for potable water and a vault for valve access with a remote access SCADA system. On site changes include a gate, new fencing and cameras.

Youtube Video: https://www.youtube.com/watch?v=oE5tqIJOk9M

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team16_laminar-engineering_sp26.pdf

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SDSU
Dr. Ramin Yazdi
Thomas Zink

DUDEK

Level 7 Engineering



SDSU EVOLVE-PLAZA DEL SOL

The Plaza Del Sol project focuses on the multidisciplinary civil engineering design of a new two-story, approximately 22,000-square-foot campus amenity building within San Diego State University's Evolve student housing development. The facility will serve as a hub for dining, retail, and conference uses. The primary emphasis of this project is the integration of site design, stormwater management, and structural systems within an active, constrained campus environment.

Youtube Video: https://www.youtube.com/watch?v=Akm1l3GQyuI

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team3_level-7-engineering_sp26.pdf

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Abdulla Ibraheem

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Oscar Ojeda
Kyle Schellenger, PE

LMJ Engineering

MT RIDGEVIEW DRAINAGE IMPROVEMENTS

LMJ Engineering proposes infrastructure improvements in Ramona, CA to address deteriorating storm drain systems, pavement damage, and erosion concerns within Mount Woodson's Home Owners Association (HOA). The project includes storm drain repairs, roadway repaving, swale reconstruction, and drainage analysis aligned with ISI Envision standards. These improvements will enhance stormwater management, reduce erosion, improve roadway reliability, and provide long-term, sustainable infrastructure solutions for the community.

Youtube Video: https://www.youtube.com/watch?v=3s6egFkj-dM

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team13_lmj-engineering_sp26.pdf

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M4 Builders



SDSU BRAWLEY STEM BUILDING

M4 Builders is constructing the new SDSU Brawley STEM Building, a 65,000-square-foot ground-up academic facility in the Imperial Valley dedicated to science and technology education. The building will feature modern research laboratories, teaching classrooms, and collaborative innovation spaces to support hands-on learning. With a $70 million budget, construction began March 1, 2026, and is scheduled for completion in September 2027. Delivered through a Design-Build approach, the project will expand educational access and strengthen the region's STEM workforce.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team5_conm_m4_sp26.pdf

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Major Water Works

ENCINITAS COMMUNITY PARK STORMWATER CAPTURE & REUSE

This project will develop a design to capture, store and treat rainwater for use in irrigating the park's landscape and grass. The key elements of the project will be to determine the amount of rainwater available from on and off site and to determine how much rainwater can be stored for use during non-rainy events.

Youtube Video: https://www.youtube.com/watch?v=GxJ2pRvL3us

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team18_major-water-works_sp26.pdf

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Mud & Meadow Construction

SDSU MISSION VALLEY RIVER PARK

Mud & Meadow Construction is leading the Mission Valley River Park project from preconstruction to completion. This 171.76 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 wet and dry utilities with new surface streets to support the stadium park and future development. Construction includes demolition of Stadium formerly known as Qualcomm Stadium while recycling most of the materials to reduce environmental impact while ensuring long-term resilience and sustainability for the community.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team6_conm_mud-meadow-construction_sp26.pdf

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P.D. JAMS Engineering

HARBOR ISLAND POLICE HEADQUARTERS

The existing Harbor Police Headquarters will be demolished and replaced with a modernized facility designed to meet current operational capacity and future public safety demands. The project also includes a multi-level parking structure to support personnel and fleet needs. Primary scopes include site, civil, stormwater, wastewater, geotechnical, and construction services. To address projected sea-level rise, the site will be regraded to elevate the finished floor, improving flood resilience and ensuring long-term operational continuity.

Youtube Video: https://www.youtube.com/watch?v=dXk2eEoNwqE

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team11_pd-jams-engineering_sp26.pdf

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Pierce Manson
Ace Vo
David Harimana

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Pacific Beach Building Co.

HOTEL DEL CORONADO - SOUTH BEACH DEVELOPMENT

The Hotel Del Coronado's South Beach Development project will deliver a three-story, residential-style beachfront village featuring luxury villas, an ocean-view pool, and private guest amenities. This $125 million development complements a broader more than $550 million restoration and revitalization plan of the resort. Pacific Beach Building Company is leading construction, bringing its coastal expertise and commitment to quality craftsmanship to this landmark beachfront expansion.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team7_conm_pacific-beach-building-co_sp26.pdf

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Sand & Steel Builders



CRAWFORD HIGH SCHOOL PROJECT

The Crawford High School, Phase 3, includes Site Modernization and Expansion. This is a transformative construction effort designed to replace the existing campus facilities with a modern, high-performance educational building. This new structure is approximately 82,854 square feet, spanning three stories and serving as the primary gateway for the campus.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team8_conm_sand-steel-builders_sp26.pdf

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SD CIVIL DESIGNERS

SDSU SPORTS DECK

The project is the design of a two level parking structure with a real grass field with a track on top to be located on SDSU's campus. The goal of the design is to provide more parking in a sustainable and useful way. The recreational field will provide greenery and better drainage for the campus as a whole. Figures, models, engineering plans will all be provided to show every detail of the design and construction plans for the SDSU Sports Deck.

Youtube Video: https://www.youtube.com/watch?v=jLfFP45XO0M

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team2_sd-civil-sports-designers_sp26.pdf

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Skyline Engineering Consultants

SKYLINE ENGINEERING CONSULTANTS
"From Soil to Skyline"

SDSU PLAZA DEL SOL

SDSU's Plaza Del Sol will be a 22,000 square foot, two story building. This building is a part of SDSU's Evolve housing development and will provide dining amenities to on-campus residents. The first floor will be utilized for kitchen and dining services, mailing services, and a convenience store. The second floor will be utilized by a large conference room, and storage space. It is expected to be completed by Fall 2026.

Youtube Video: https://www.youtube.com/watch?v=IOypUb7EkYw

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team4_skyline-engineering-consultants_sp26.pdf

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kpff

SQ Engineering

SQ ENGINEERING
SUPERB QUALITY

HARBOR ISLAND POLICE HEADQUARTERS

Our project includes an 80,000 sf office space, a 400 space parking structure, and the elavation of the entire site. All of this work has to be done while keeping the existing police headquarters in use. Therefore, to make this project work, we are proposing two phases. One phase where we prepare the site where the new buildings will be constructed, and the other phase to demolish and remove the old building.

Youtube Video: https://www.youtube.com/watch?v=wUyu1dvryjc

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team12_sq-enginering_sp26.pdf

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Summit - Horizon

Summit - Horizon

ENCINITAS COMMUNITY PARK STORMWATER CAPTURE AND REUSE

California continues to experience long and frequent droughts, which increases the need for water supply reliability. Our project is designed to address this need through stormwater capture and reuse at Encinitas Community Park. Stormwater capture involves collecting stormwater runoff from rain events, treating the water, and reusing it for park irrigation. To support this, we are designing a storage tank and a pump station that can supply the captured stormwater to the irrigation system of the park.

Youtube Video: https://www.youtube.com/watch?v=zWAxDEOwG5s

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters_prince/team19_summit-horizon_sp26.pdf

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City of Chula Vista
Valeria Ceron

Wetlands Construction



SAN DIEGUITO WETLAND RESTORATION PROJECT

The San Dieguito Wetlands Restoration Project is a large-scale environmental restoration project located in the San Dieguito River Valley within the City of Del Mar and the City of San Diego. This project consists of two phases and is being completed for Caltrans as part of environmental mitigation tied to regional transportation improvements. The project covers approximately 141 to 150 acres and has an estimated construction cost of $66.1 million, with the overall Phase II restoration estimated at about $87 million.

Youtube Video:

Poster: https://ccee.sdsu.edu/_resources/files/design-day-2026/posters/team9_conm_wetlands-construction_sp26.pdf

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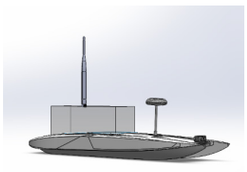
MARATHON CONSTRUCTION CORPORATION

ELECTRICAL & COMPUTER ENGINEERING

ANCHOR



ANCHOR–AUTONOMOUS NAVAL CONTROL FOR HIGH-RANGE OPERATIONS & RELIABILITY

ANCHOR is a modular retrofit kit for commercially available RC boats. The kit preserves the stock motor and rudder but replaces the control electronics to enable long-range telemetry and GPS-based tracking. A Raspberry Pi Pico microcontroller processes onboard control, and communication is done via a LoRa link. User input is controlled by a GUI on shore, which controls the motor and rudder systems, and various sensors on board.

Youtube Video: https://www.youtube.com/watch?v=6Q4eZ9iWH-g
Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-anchor.pdf

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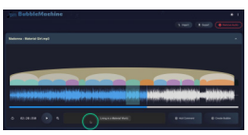
Naval Information Warfare Center Pacific
Joseph Fields

Naval Information Warfare Center PACIFIC

BubbleMachine

BUBBLEMACHINE



BubbleMachine is a web-based tool created for people in the music industry that works with audio in a clear and intuitive way. Users can load audio stored on their device or extract audio from video files, then create precise playback markers called “bubbles” to add comments and feedback. The project focuses on improving tablet usability, touch interaction, and performance, while keeping all media local to the user’s device for privacy and copyright safety.

Youtube Video: https://youtu.be/_FLmiyi7eQE
Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-bubblemachine.pdf

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DC/AC

MOTOR/GENERATOR INVERTER CONTROLLER

DC AC

The purpose of the project is to develop a Motor Generator Inverter Controller that tests the characteristics of an AC machine under various operating conditions. The system inputs a 1φ 120V AC outlet power into a PowerFlex 525 Variable Frequency Drive (VFD) that outputs 3φ 208V AC into the motor. The motor drives the generator through a shaft and the generator produces 3φ 208V AC power. The 3φ 208V is supplied into a second PowerFlex 525 VFD that also outputs 3φ AC Power. This creates a full motor/generator inverter system used to study speed control and voltage.

Youtube Video: https://youtu.be/WBc9wU1gxqA?si=A6fYQZWI3gaexqB-
Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-dcac.pdf

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Vidyashankar Rangaswamy

GENERAL ATOMICS ELECTROMAGNETICS

HydroGlow

GENERATING A NOVEL, HIGH ACCURACY, HYDROGRAPHY DATASET TO ASSESS SITE VIABILITY FOR WATER CO-LOCATED SOLAR ENERGY PROJECTS.

The goal of this project is to create a repeatable and scalable methodology to build a novel hydrographical geospatial database of waterbodies viable for water co-located solar (AquaPV). The project involves identifying waterbodies, creating highly accurate polygons of them, assigning a multitude of metadata to each polygon, determining the feasible buildable area of each waterbody, and determining the proximity to major infrastructure like transmission lines to assess economic feasibility.

Youtube Video: https://youtu.be/A5DDpiA39vQ?si=y9yn1UsHJVBj71Yw

Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-hydroglow.pdf

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WATTS ON WATER

NAND5

END-TO-END IC DESIGN

Our senior design team implemented a fully tapeout-ready AES-256 CBC encryption/decryption core, completing the full RTL-to-GDSII ASIC design flow including synthesis, place-and-route, DRC/LVS verification, and post-layout simulation. In parallel, we developed an FPGA-based prototype on a custom PCB with a UART-to-USB interface, enabling secure communication with a laptop through a custom GUI and driver software. The system demonstrates practical hardware cryptography and secure hardware integration inspired by Trusted Platform Module (TPM) architectures.

Youtube Video: https://www.youtube.com/watch?v=wCJjUgak1f4

Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-nand5.pdf

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SDSU College of Engineering Electrical and Computer Engineering

Ohmies

HIGH PRECISION OHMMETER FOR MULTI-CONTACT CONNECTORS

Masimo designs instruments, sensors, and cables that terminate connections in a variety of multi-contact connectors. When connectors are repeatedly cycled through insertions and removals, they wear the plating on the contacts and/or the pins and sockets themselves. Our device is capable of continuously monitoring a multi-contact connector for a change in contact resistance over the duration of connector insertion/removal cycles.

Youtube Video: https://youtu.be/03FJRocX6aY

Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-ohmies.pdf

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Glenn Pohly

Masimo®

R.G.A (Robotic Gaming Arm)

ROBOTIC GAMING PARTNER

The robotic gaming partner includes an AI powered 6-DOF arm driven by the NVIDIA Jetson Nano. The robot uses camera vision to play a 2 dimensional game on a whiteboard against a human user. When a user approaches the system, a touchscreen display greets them and allows them to choose which game to play against the robot. An ultrasonic sensor scans the 'warning' and 'play' zone to allow for operation of the system. A custom ADC was developed to convert the analog output of the sensor into the GPIO pins of the Jetson Nano.

Youtube Video: https://youtu.be/5gB114QznCg

Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-rga.pdf

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VROM AUTOMATION

Team InverTech

REALIZING THREE-PHASE CURRENT AND VOLTAGE SOURCES AND HARDWARE-IN-THE-LOOP VALIDATION

This report outlines the conception, design, development, and testing for the DC-to-AC 3 phase Inverter project under the sponsorship of SDSU Assistant Professor Tong Huang. The primary objective is to develop hardware-usable Pulse Width Modulation (PWM)-control-algorithms for a grid-tied inverter. These standardized control algorithms will aid Asst. Prof. Tong Huang with his research on grid security in the Texas electricity market (ERCOT).

Youtube Video: https://youtu.be/MYq7lJ63554

Poster: https://electrical.sdsu.edu/design-day/files/2026/ece-invertech.pdf

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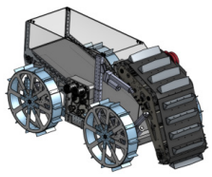
MECHANICAL ENGINEERING

ATHENA - Payload Team



NASA LUNABOTICS - PAYLOAD

Team ATHENA (Aztec Technology for Harvesting, Exploration, and Navigation in Astro-mining) is representing SDSU in the NASA Lunabotics 2026 Competition. The team is tasked with the design and build of the payload systems for a telerobotic rover capable of traversing, excavating, transporting, and depositing lunar regolith. This supports NASA's Artemis missions to use in-situ resources for lunar construction. ATHENA will travel to Kennedy Space Center and University of Central Florida (UCF) to compete in a simulated deployment lunar mission against other universities.

Youtube Video: https://www.youtube.com/watch?v=b2-geFlVfi0

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project33.pdf

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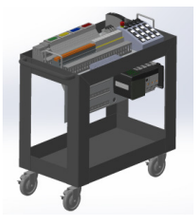
Aztec Control Solutions



BACKUP RELAY SYSTEM BENCH TRAINING SIMULATOR

Solar Turbines manufactures gas turbines, compressors, and pump drivers for power generations and oil & gas markets. Standardized safety control systems are a cornerstone to provide protection from hazards. It includes a PLC-based system and a backup relay system working together to bring equipment to a safe position. Training is performed using a simulator bench platform, but the current bench does not reflect the modern hardware. The goal is to design a new simulator aligned with Solar Turbines current hardware and include training documentation.

Youtube Video: https://youtu.be/otjiAMWtS4M

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project5.pdf

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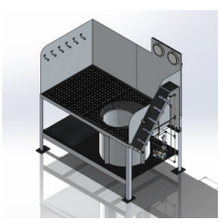
Solar Turbines A Caterpillar Company

Benchwarmers



GAS TURBINE FUEL INJECTOR HYDROSTATIC TEST BENCH

Due to increased production demand for high-output gas turbines driven by the data center boom, Solar Turbines required additional hydrostatic leak-testing capacity to support increased fuel injector production throughput. This project included the design, fabrication, and validation of a new hydrostatic leak-test bench featuring a 10-gallon pressure vessel rated for 300-psi testing to verify fuel-injector brazed joints.

Youtube Video: https://youtu.be/pTjfMX0vL58

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project-4.pdf

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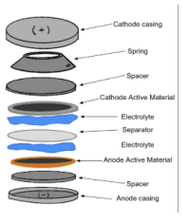
Solar Turbines A Caterpillar Company

Cell Synergy



RATIONAL DESIGN OF FAST-CHARGING HIGH-VOLTAGE LI-ION BATTERIES WITH ENHANCED SAFETY AND LONGEVITY

This project focuses on developing high voltage, fast charging lithium ion batteries with improved safety and extended lifespan. Our team will synthesize and characterize advanced cathode and anode materials, analyze Li ion transport and interphase stability, and fabricate coin and pouch cells. Performance targets include high energy and power density, strong capacity retention at up to 10C, and successful demonstration of a 20 mAh bipolar stacked pouch cell.

Youtube Video: https://www.youtube.com/watch?v=ImrZqrkrM8s

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project23.pdf

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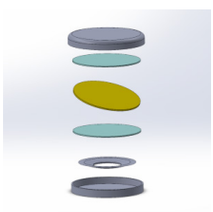
E2 Electrochemical Energy Lab @ SDSU

CeramiCharge



CERAMIC 3D PRINTING OF SOLID STATE BATTERY

Our project strives to create a safer and more efficient 3D printable solid-state electrolyte (SSE) for solid-state batteries. Compared to traditional lithium-based liquid electrolytes, our solid electrolyte uses LLZTO ceramic powder as the main ingredient. We used 3D printing to fabricate complex and stable structures. This created a solid electrolyte that prevents the formation of dendrites and decreases the possibility of toxic leakages and critical failures. The result is an overall safer, longer-lasting battery.

Youtube Video: https://youtu.be/a1mObXCKUYU

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project24.pdf

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Khoi Le

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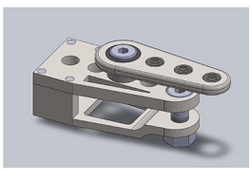
Free Ride



ADAPTIVE E-BIKE PEDAL SYSTEM

This project is sponsored by the national non-profit organization, Project S.E.R.V.E. which has the mission of supporting disabled US Veterans and first responders. The project was created in direct support of a disabled US Veteran who had suffered a left leg injury and as the result of the injury, has not been able to ride a bike. The design solution provides the Veteran the ability to ride a bike for the first time in many years. The team developed an adaptive pedal allowing full pedal motion and comfortable riding conditions for the disabled veteran.

Youtube Video: https://youtu.be/ToG61jM2OCc

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project19.pdf

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Project S.E.R.V.E.
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RJL Engineering
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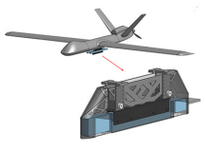
PROJECT S.E.R.V.E. Student Engineering for Resilience of Veterans & Emergency Responders

Helios



MQ-9 MODULAR PYLON

This project focuses on the design of a modular pylon capable of supporting multiple payload configurations for the MQ-9, a multi-role remotely piloted aircraft. A pylon is a wing-mounted structure used to carry external stores. The design must integrate mounting provisions for two Line Replaceable Units (LRUs) and support two payload carriage systems: an expanded Bomb Rack Unit (BRU) with both 14-inch and 30-inch lug spacing, and a Missile Rail Launcher (MRL) with 30-inch mounting holes. A scaled prototype was manufactured in order to validate the design.

Youtube Video: https://www.youtube.com/watch?v=EI-b9D_4gpU

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project8.pdf

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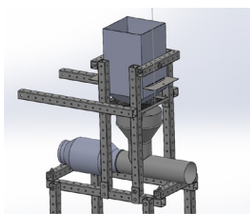
IGNITE



EMBER GENERATOR 2.0

Our team developed an ember generator for wildfire research to replicate how embers behave at varying wind speeds. The system burns fuel inside a combustion chamber to produce embers and they flow into a wind tunnel with an integrated fan that directs them at controlled speeds in a desired direction. Designed to be compact and portable, the device allows for safe, repeatable testing. This project supports research on fire risks to vegetation and structures in Wildland-Urban Interface (WUI) communities, helping advance wildfire safety strategies.

Youtube Video: https://www.youtube.com/watch?v=KmG0hUFIG6w

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project20.pdf

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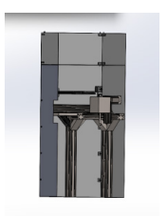
Laser Layers



SOLAR 3D PRINTING

In partnership with the SDSU Mechanical Engineering's Powder Technology Lab on campus, Laser Layers was tasked with developing a controllable, lab-based solar selective laser sintering (SLS) printer, which could lead to efficient manufacturing both on earth and extraterrestrially. Solar SLS printing offers a unique opportunity to advance research at the interestion of additive manufacturing and renewable production through the development of a controlled platform and solar simulator.

Youtube Video: https://www.youtube.com/watch?v=61I5AZzJD04

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project21.pdf

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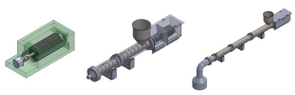

DESIGN AND PROTOTYPING OF A LUNAR-COMPATIBLE NOMEX-NYLON RECYCLING SYSTEM FOR ADDITIVE MANUFACTURING

Our project takes in waste products from a theoretical long-term space mission and recycles them into a robust 3D-Printer filament. It does this by mixing liquid thermally separated thermoplastics with a blend of shredded Nomex fibers. The separated thermoplastic and nomex are mixed into a hopper to be moved through a filament barrel and screw system to an extrusion die. The system has potential for application support Lunar missions.

Youtube Video: https://youtu.be/1XGO4wiMNps

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project27.pdf

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SolidState Systems



SOLID-STATE PLASTICIZED INTERLAYER ADDITIVE MANUFACTURING (SPIN-AM)

Solid-State Plasticized Interlayer Additive Manufacturing (SPIN-AM) enables the solid-state joining and formation of steel components through friction-generated heat. Using a CNC-driven rotating tool, SPIN-AM plastically deforms and consolidates a steel substrate without melting the base material, reducing defects commonly associated with traditional welding processes. The project focuses on tool geometry development, process parameter optimization, and controlled material flow to enable repeatable fabrication of large-scale structural components.

Youtube Video: https://youtu.be/kuJrjxnOmvg

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project28.pdf

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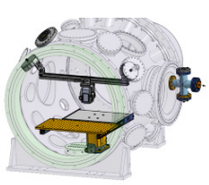
Stage Zero



ASML VACUUM METROLOGY TEST SYSTEM

This project involved the design and integration of an in-vacuum, externally actuated Z-stage with precise vertical and horizontal motion for repeatable sample positioning under vacuum. The system includes a high-resolution internal digital camera for visual monitoring and an external thermal camera for temperature mapping through an IR transparent viewport. Together, the platform enables stable, non intrusive visualization and thermal analysis of tin hydrogen interactions without breaking vacuum.

Youtube Video:

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project10.pdf

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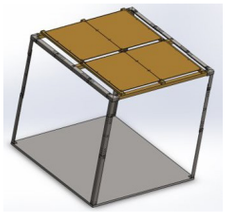
TarpTuga



MODULAR TARP SUPPORT STRUCTURE

Solar Turbines is looking to eliminate the custom wood frames currently used to transport the company's machinery. The proposed modular tarp support structure design solution uses modular steel supports arranged as an adaptable frame system designed to support and secure a tarp over non-enclosed packages of varying geometry. The primary function of the design is to provide physical support, preventing tarp sagging, ensuring weather protection, and improving overall stability during storage or transport. This aims to eliminate the use of custom wooden frames and replace them with standardized parts.

Youtube Video: https://www.youtube.com/watch?v=m_pL5VjDVJM

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project3-adesign-dayposter.pdf

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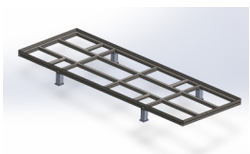
Solar® Turbines
A Caterpillar Company

Team Heavy Metal



STEEL FRAME BASES FOR TURBOMACHINERY PACKAGES

In collaboration with Solar Turbines, Team Heavy Metal has developed steel frame bases that can support their Titan 130 and Titan 250 series of turbomachinery packages, which weigh between 80,000 and 140,000 pounds. The team's robust, streamlined designs are optimized for in-house manufacturing rather than outsourcing, thereby significantly reducing production costs and lead times for the company.

Youtube Video: https://youtu.be/sNb3tfliQMs

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project-2.pdf

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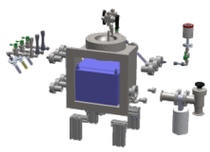
Team Perseus



CHEMICAL VAPOR DEPOSITION REACTOR SYSTEM INTEGRATION AND OPTIMIZED VAPOR SHIELD DESIGN

Chemical vapor deposition (CVD) is a vacuum-based process used to fabricate conductive polymer thin films. Sponsored by SDSU Mechanical Engineering's Advanced Manufacturing for Energy Devices (AMED) Laboratory, this project aims to complete two systems: an oxidative CVD reactor and an initiated CVD reactor. Both systems incorporate a pressure transducer, throttle valve, and PID control algorithm to regulate base and process pressures using a Leybold vacuum pump. Additionally, a vapor shield is designed and fabricated to improve deposition rates and precursor yield in the oCVD reactor.

Youtube Video: https://youtu.be/5Y8u-UXf4rE

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project29.pdf

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AMED Lab
Advanced Manufacturing for Energy Devices

The Incombustibles



3D PRINTING OF BIOINSPIRED FLAME RETARDANT STRUCTURES

Flame-retardant structures have gained attention in the industrial, aerospace, and thermal power fields due to their resistance to extreme high-temperature exposure, yet designing protective materials with complex geometries remains challenging. This project develops a 3D-printed, bioinspired flame-retardant composite that mimics nacre's brick-and-mortar architecture. Boron nitride–reinforced composites are fabricated and evaluated through thermal and mechanical testing to improve heat resistance and impact performance for advanced fire-protection equipment.

Youtube Video: https://youtu.be/Uaqxf0OvHMw

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project25.pdf

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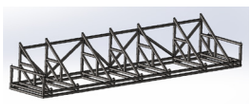
BIOINSPIRED 3D PRINTING

TurboPack

REUSABLE PACKAGING SYSTEMS FOR TURBOMACHINERY PACKAGE COMPONENTS



This project involves the design and fabrication of a reusable transport structure for safely shipping turbomachinery enclosure roof panels between manufacturing facilities. The new system replaces an existing method that created oversized loads, increasing cost and logistical complexity. The team developed a welded steel A-frame structure that supports multiple panel sizes at fixed angles, improving transport efficiency, reducing damage risk, and supporting sustainability through a durable, reusable packaging solution.

Youtube Video: https://www.youtube.com/watch?v=qG1bWikyRrU

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project-design-day-poster.pdf

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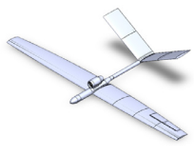
MECHANICAL & AEROSPACE ENGINEERING

Albatross



3D-PRINTED FIXED-WING 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://youtu.be/AlsgyRwGP0w

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project35.pdf

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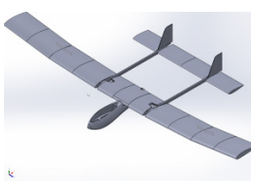
Cloud 9



3D-PRINTED FIXED-WING AIRCRAFT COMPETITION (C-3DPAC)

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Youtube Video: http://youtube.com/watch?v=Z74l66mIpD4&feature=youtu.be

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project38.pdf

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Glide or Die



3D-PRINTED FIXED-WING 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://youtu.be/fl7duLHxDQc

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project37.pdf

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Motorsport Aerodynamic Solutions



RACE CAR AERO WING

This project focused on improving the aerodynamic performance of Ron Fletcher's Revolution 500 SC race car. The team analyzed the existing rear wing geometry, developed CAD models, and performed FEM structural analysis and CFD aerodynamic simulations. Three carbon-fiber rear wings and two front splitter flaps were designed and manufactured, along with custom mounting hardware to integrate them onto the vehicle. Performance improvements were validated through on-track testing overall reducing lap times.

Youtube Video: https://www.youtube.com/watch?v=oFK2aGCuhK4

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project15.pdf

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Osprey



3D-PRINTED FIXED-WING AIRCRAFT COMPETITION (C-3DPAC)

The California State University 3D-Printed Aircraft Competition invites teams to design, build, and fly an aircraft fabricated with 3D-printed parts. The competition focuses on innovation and aerodynamics. Teams must balance weight, strength, and design elements while maximizing performance. Aircraft are judged via design reviews and performance evaluations, with the challenge being to achieve the longest flight time. Participants will develop their engineering knowledge, teamwork skills, and gain hands-on experience in additive manufacturing and aircraft design.

Youtube Video: http://youtube.com/watch?feature=shared&v=qhO0cpbKP2c

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project36.pdf

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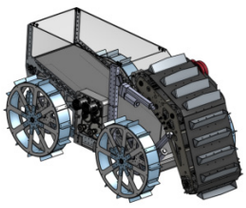

NASA LUNABOTICS - PROPULSION, NAVIGATION AND CONTROL

Team ATHENA (Aztec Technology for Harvesting, Exploration, and Navigation in Astro-mining) is representing SDSU in the NASA Lunabotics 2026 Competition. The team is tasked with the design and build of the propulsion, navigation, control system for a telerobotic rover capable of traversing, excavating, transporting, and depositing lunar regolith. This supports NASA's Artemis missions to use in-situ resources for lunar construction. ATHENA will travel to the University of Central Florida and Kennedy Space Center to compete in a simulated deployment lunar mission against other universities.

Youtube Video: https://www.youtube.com/watch?v=b2-geFlVfi0

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project32-.pdf

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Satya Sai Nagarjuna-Varma Nampalli

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AztechPrime II



MECHANICAL ARM INTEGRATION AND CHASSIS REFINEMENT FOR HUMANOID ROBOT

This project is the second phase of the SDSU AI Center's AztechPrime project. The goal of this project is to design a modular humanoid robot for emotional and social interaction. Phase two of this project focused on reimagining the existing chassis, designing and engineering robust robotic arms, and integrating these changes into the existing system for autonomous movement and interaction with others.

Youtube Video: https://www.youtube.com/watch?v=0WQNuvFzxTc

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project22.pdf

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SDSU James Silberrad Brown Center for Artificial Intelligence

CryoBod



HUMAN COOLER

The Human Cooler project designs a wearable personal cooling device that is capable of shedding enough heat to allow the user to perform activities of moderate to high levels of physical exertion while maintaining a core body temperature of 100.4°. This device is applicable to those who are required to perform strenuous physical activity in environments with extreme heat in order to help prevent these individuals from developing heat related illnesses.

Youtube Video: https://youtu.be/XuyJDwuAJaM

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-cryobod.pdf

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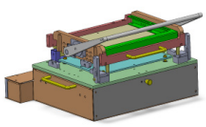
CTRL+ALT+HEAL



DISPENSING TEST STATION

This project focuses on designing an in-circuit testing fixture that integrates mechanical and electrical components to test the functionality of PCBAs that are to go into hospital grade medication dispenser. The fixture performs a bed-of-nails test on the PCBA by clamping it securely and sending electrical test signals to the PCBA using spring loaded electrical test probes.

Youtube Video: https://youtu.be/we2KygYBTow

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-ctrl.alt.heal.pdf

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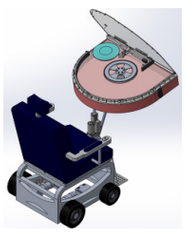
DiscAbility



DISC GOLF LAUNCHER

This detachable wheelchair-mounted disc golf launcher was built to allow quadriplegic veterans to participate fully in the game of disc golf. It enables users with limited mobility to safely and accurately launch a disc at their desired power and angle using accessible controls. The launcher promotes inclusivity, independence, and competitive play, and will be used in the National Veterans Wheelchair Games this summer.

Youtube Video: https://youtu.be/nwD3YKwEgdo

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project18.pdf

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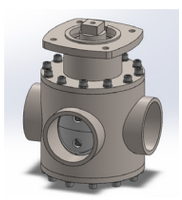

DESIGN, ANALYSIS, BUILD AND LIMITED TEST OF THERMAL CONTROL VALVE

This is a project sponsored by the General Atomics Electromagnetics Group. The project involves the design, prototype build and test of a light-weight thermal control valve—known as a valve mixer. A valve mixer is a mechanical device that controls fluid temperature by blending fluids of different temperatures to provide consistent and precise fluid temperature and control.

Youtube Video: https://www.youtube.com/watch?v=d3r_IbgoHns

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-heat.pdf.pdf

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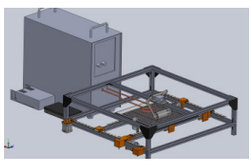

INDUCTION WELDING APPARATUS FOR THERMOPLASTIC COMPOSITE JOINING

This project involves the design, fabrication and test of an induction welder for joining thermoplastic composites, specifically carbon fiber-reinforced PEKK polymers. The induction welder is planned to be capable of welding plates (or curved cylindrical panels) from 4 plies to up to 32 plies thick (0.5 mm to 4 mm) and with dimensions of 30 cm x 30 cm. The induction welding head uses a pancake-type coil, which moves along the weld region in the x-y plane at a specified distance from the plate. For curved panels, the welding coil includes xyz translation.

Youtube Video: https://youtu.be/H0ghfvI0V9s

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project30.pdf

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Mechatropics



ROBOTIC PALM TRIMMER DEVELOPMENT

The robotic palm trimmer replaces manual palm trunk trimming to improve safety and ease. It features a circumferential track system and a radial positioning stage that has a 360° reach around the trunk to cut fronds. The trimmer integrates with the Robotic Palm Elevator that operates through a shared controller and power source. The elevator moves vertically via a joystick control while maintaining constant arm tension as it performs the cutting process.

Youtube Video: https://www.youtube.com/watch?v=wYDwWDDVL_0

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-mechatropics.pdf

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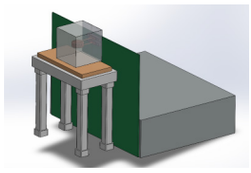

DEVELOPMENT OF INDUCTION HEATING SYSTEM VIA ELECTRO-NANO-PULSING

The goal of this project is to create a novel induction system that is solenoid-like and that will be able to melt metal powders within a few nano to micro seconds. This heat induction system uses an Electro-Nano-Pulse (ENP) power supply to generate a recurring current with each pulse at a specific frequency, which generates a changing magnetic field that produces sufficient heat to reach near the metal powder's melting point.

Youtube Video: https://youtu.be/j_ex_JWgqzU

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project26.pdf

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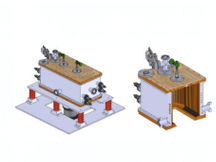
Plasma Frontiers



DESIGN AND FABRICATION OF LOW-TEMPERATURE PLASMA DIAGNOSTICS

This project focuses on key plasma diagnostic systems for General Atomics' DIII-D SupRISE Test Stand, which utilizes an RF-inductively generated ion source to replace the current arc-filament system on the tokamak. The Plasma Eater diagnostic system and Faraday shield developed as part of this project are intended to enable the SupRISE Test Stand to operate at higher power levels while providing more accurate and reliable data acquisition of desired plasma parameters.

Youtube Video: https://youtu.be/pe2DW-n1wrE

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-plasma.frontiers.pdf

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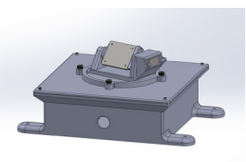

MECHANICAL RF STEERING USING A PATCH ANTENNA ON A GIMBAL FOR JAM RESILIENT SWARM COMMUNICATIONS FOR SMALL UAS.

This project involves creating a mechanically steered high frequency antenna on a gimbal assembly for use with drone operations. The design will allow for a smaller antenna with a narrower beam to provide a high gain as compared to prior solutions. This is designed to be used on commercial off the shelf drones, and is designed with the intentions of being used in jammed environments.

Youtube Video: https://www.youtube.com/watch?v=enk4KNly5_k

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project31-.pdf

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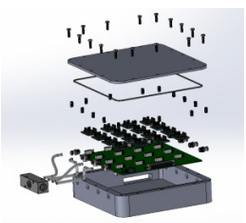

MULTI-SENSOR GAS FLOW CELL TESTING CHAMBER

This project's goal is to design and construct a single flow-cell test chamber for testing multiple gas sensors simultaneously. The chamber accomodates an array of gas sensors. A data acquisition (DAQ) system is incorporated to collect the electrical output from each sensor channel and transmit the measurements to a computer interface, where the real-time data is displayed on a screen for monitoring and recording.

Youtube Video: https://www.youtube.com/watch?v=cCaXGtRIefg

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-sensetec.pdf

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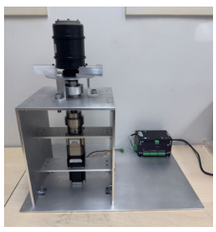

AUTOMATED SYNCHRO TESTER

The Automated Synchro Tester is a joint Mechanical Engineering and Electrical & Computer Engineering project sponsored by General Dynamics. The tabletop system autonomously rotates a synchro to specified mechanical angles while measuring the corresponding electrical angle to calculate angular error. Programmed in LabWindows, it reduces test cycle time and operator ergonomic risk. The system integrates precision actuation, sensing, and data acquisition to improve production efficiency, measurement reliability, repeatability, and reproducibility.

Youtube Video: https://www.youtube.com/watch?v=TYXlyKC6qVg

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project13.pdf

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GENERAL DYNAMICS
Ordnance and Tactical Systems

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tinyScrubCam



To help the Loisaba Conservancy in Kenya with their mission to monitor black rhinos, a low-power, solar-powered, AI trained, LoRa capable camera system has been designed, fabricated and tested providing the ability to send alerts when the rhinos are spotted. The system sends a picture and the location data to the Conservancy staff providing them data on the best locations to observe the rhinos. The system includes an enclosure rated an IP67 and includes the option to be mounted to either a tripod or trees.

Youtube Video: https://www.youtube.com/watch?v=ovQ8Iqe3uOA

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project17.pdf

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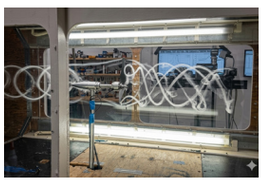
MECHANICAL, ELECTRICAL & COMPUTER, AND AEROSPACE ENGINEERING

PropOps



GENERAL ATOMICS MQ-9 PROPELLOR OPTIMIZATION

This sponsored project with General Atomics Aeronautical Systems focuses on designing, building, and testing an optimized aircraft propulsor that improves efficiency and reduces noise compared to a provided baseline propeller. An interdisciplinary student team developed the propulsor and a dedicated testbed to compare thrust, efficiency, and acoustic performance using off-the-shelf sensors and data acquisition systems, demonstrating measurable advancements in quiet, efficient propulsion technology.

Youtube Video: https://www.youtube.com/watch?v=gXXfTZwHXQY

Poster: https://electrical.sdsu.edu/design-day/files/2026/joint-propops.pdf

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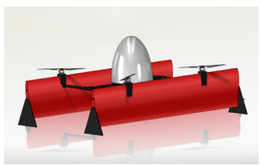

CALIFORNIA UNMANNED AERIAL SYSTEMS COMPETITION (C-UASC)

Our multidisciplinary team developed an efficient UAV for the California Unmanned Aerial System Competition. This 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, 2026.

Youtube Video: https://www.youtube.com/watch?v=Vuv8zm4DbYE

Poster: https://mechanical.sdsu.edu/design-day/_files/2026/project34.pdf

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