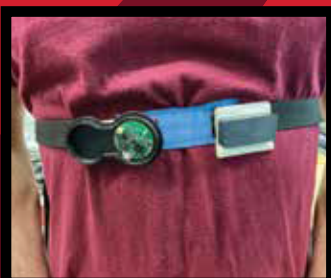


2021 SPRING VIRTUAL ENGINEERING DESIGN DAY

WEDNESDAY, MAY 5, 2021
FROM 1:00PM TO 4:30PM

PLEASE JOIN US FOR THE ZOOM EVENT:
[HTTPS://SDSU.ZOOM.US/S/83277265234](https://SDSU.ZOOM.US/S/83277265234)



WELCOME



At the SDSU College of Engineering, we are doing our part to keep our students and community members safe and healthy. In compliance with the restrictions prohibiting gatherings of people in San Diego County, we are bringing our annual Engineering Design Day event to you, in a virtual format.

Please save the date for our 2021 Virtual Engineering Design Day event which will be held via Zoom, on Wednesday, May 5, 2021, from 1:00pm-4:30pm. Please join us for the Zoom event at:

<https://SDSU.zoom.us/j/83277265234>

We are proud to still have our undergraduate students showcase their design project work completed during the 2020-21 Academic Year. There will be teams representing our Senior Design classes in Aerospace Engineering, Civil, Construction & Environmental Engineering, Electrical & Computer Engineering, and Mechanical Engineering.

Please join me in congratulating our student teams on their innovative design projects which represent the culmination of the technical knowledge they have developed during their time at San Diego State University's College of Engineering. These projects provide the students with real-world experience that involve design constraints, budgets, reviews, and deadlines. Through these projects our students learn to apply and develop their critical thinking skills, recognize human and societal needs, and design novel, sustainable engineering solutions.

We are grateful to our many sponsors for their generous support of these student projects. Our sponsors include: ASML, Caltrans, City of Escondido, Dexcom, D&K Engineering, Michael Baker International, NASA, Nordson Electronics Solutions, Northrop Grumman, Popular Rotorcraft Association, San Elijo Joint Powers Authority and Quality of Life Plus. Many of these sponsors are integrally involved with the student design teams and serve as mentors to the teams. This provides meaningful projects of value, and instills a professional orientation in the student teams. We appreciate all of our sponsors and their support for the student teams.

We hope to see you virtually on May 5 at 1pm, to join and enjoy the SDSU's Spring 2021 College of Engineering Virtual Design Day.

I hope that you and your families remain safe and healthy during these challenging times.

Eugene Olevsky, Ph.D.

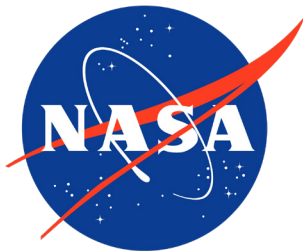
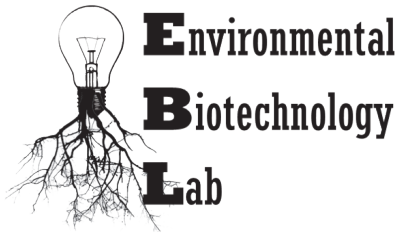


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2021 Design Day Faculty**AEROSPACE ENGINEERING****Ahmad Bani Younes, Ph.D., Assistant Professor***e: abaniyounes@sdsu.edu*

Dr. Bani Younes is an Assistant Professor in the Department of Aerospace Engineering. He received an M.S. in Aerospace Engineering from the University of Dayton and a Ph.D. in Aerospace Engineering from Texas A&M University. Dr. Bani Younes' research interests lie in the areas of optimization, estimate and control applications in dynamical systems; guidance, navigation, and astronautics; space robotics and autonomous UAS; and algorithm development. After his successful achievement in building the Spacecraft Platform for Astronautics & Celestial Emulation (SPACE) at Khalifa University, Dr. Bani Younes is currently developing a Space GNC and astronautics laboratory at SDSU. It aims to be a 6DOF facility that supports comprehensive studies and hardware experiments for sensing, guidance, dynamics, and control of space operations in an operationally relevant environment. The lab conducts research in robotic sensing and control with an aim to enhance the fields of proximity operations, human-robot interaction, stereo vision, swarm robotics, and autonomous aerial vehicles.

**Geoffrey S. Butler, Lecturer***e: 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 has over 39 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.

CIVIL, CONSTRUCTION & ENVIRONMENTAL ENGINEERING**Mark Filanc, PE, CEO, J.R. Filanc Construction Company Inc., Lecturer***e: mefilanc@sdsu.edu*

Mark 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 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, the Department of Civil, Construction & Environmental Engineering Industry Advisory Board, and is a lecturer for CIVE 495 Senior Design. 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

e: jrhaughey@mbakerintl.com

Jim Haughey is Vice President with Michael Baker International in San Diego, California. Jim has over 25 years of experience in Design-Build with an emphasis in public social infrastructure, military engineering, healthcare, aviation, and school development. He is a registered Professional Engineer, LEED Accredited Professional, Certified Quality Manager (CQM), and Envision Sustainability Professional (ENVSP). Jim has a BS in Civil Engineering (BSCE) from San Diego State University and has an MBA from the University of Phoenix. Jim is a Past President of APWA and serves on several industry boards including Society of American Military Engineers (SAME), ACE Mentorship San Diego, Design Build Institute of America (DBIA), SDSU College of Engineering Dean's Advisory Board, and SDSU CCEE Industry Advisory Board. He is currently the West Region Design-Build Practice Leader and is also serving as an Adjunct Engineering Lecturer at SDSU (CIVE 495).



John Prince, PE, PMP, QSD, Lecturer

e: jprince@delanegroup.com

John Prince has been teaching at SDSU since 2011 with CIVE 100 Intro to Civil Engineering and 2012 with CIVE 495 Senior Design. John is a practicing civil engineering consultant as Co-Owner and San Diego Office Principal for DELANE Engineering. John's initial goal and continued passion for teaching at SDSU is to enhance the industry involvement and knowledge of the students, 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, who is also a Civil Engineer. They now have two children (both girls, 6 and 10) and John is most proud that his girls are now very active skiers!

ELECTRICAL & COMPUTER ENGINEERING



Barry L. Dorr, PE, Lecturer

e: bdorr@sdsu.edu

Barry Dorr is a full-time lecturer in SDSU's Department of Electrical and Computer Engineering. Prior to that he worked for San Diego Electronics companies for 35 years as a design engineer and project manager. Between 1995 and 2006 he owned a small product development firm creating digital radios, control systems and audio systems for local manufacturers. He holds eight patents for various communication, control, and calibration systems. Professor Dorr's Senior Design course (EE/COMPE 496) emphasizes practical applications of the fundamentals taught in the ECE curriculum completed within a framework of industry-standard project management practices and personal/team ethics.

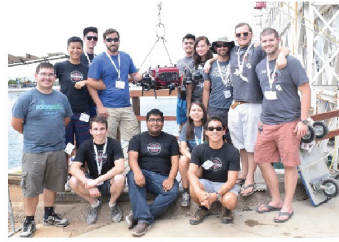
MECHANICAL ENGINEERING



Scott Shaffar, Ph.D., Lecturer

e: 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 (ME 490) 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.



Every gift to the College of Engineering has IMPACT. Generous donor support helps to ensure student success, promote faculty excellence, fund meaningful research, and champion the continued success and growth of the College.

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Advance Diversity and Inclusion in Engineering

The College of Engineering is grateful for all those who provide philanthropic support. If you have an interest in supporting the College, please contact Kate Carinder, Senior Director of Development, College of Engineering at kcarinder@sdsu.edu.

The Campanile Foundation | Tax ID 33-0868418
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BADE - **The SDSU Design Studio (EIS-106B) Air Filtration System**
The Bomb Squad - **USN Next Generation Bomb Hoist**
Carbon Creations - **Carbon Particle Generator**
The Cool Guys - **SDSU Aztec Electric Racing (AER) Accumulator (Battery Pack) Cooling System**
CryoSAMP - **De-Icing System for Composite Leading Edges**
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RamPo - **Power Production Using Thermally Infused Ram Pump**
Shock and Roll - **Position Sensitive Shock Absorbers for SDSU Aztec Baja**
Smile and Wave, Boys - **Waveski Launcher**
Sterilight - **Solar Sterilization System**
Surf Limitless - **SDSU Motorized Waveski**
Team Rampage - **Portable Ramps for Curbs**

MECHANICAL ENGINEERING (CONT...)

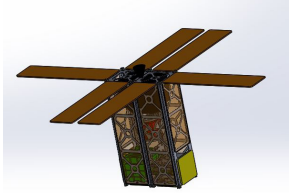
Team SIDD - **SBS Heat Sealing Process Design**

Thermal Press - **Modification of a Tube Furnace into an Air Atmosphere Hot Press**

Young Smart Designs - **Automated Tooling Design for Printer Circuit Board (PCB) Dispense Application**

American Space Solutions

MEMBERS: Chandler Berney, Kai Colligan, Jake Donerkiel, Nathan Machak, Joseph Randazzo, Byron Reese, Greyson Tracey
 ADVISOR: Dr. Ahmad Bani Younes - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/87854652245>



Lunar Communications Satellites

American Space Solutions strives to provide reliable, efficient, and sustainable systems and products for the United States continued exploration in space. With the Lunar Communication Satellites ability to provide reliable, accelerated, and clear communication, companies are able to ensure a safer and more efficient way to transmit and receive information on the surface of the Moon. Our Lunar Communication Satellite is providing sustainable communications that will no longer rely on line of sight communications.

AstroTech Space Systems

MEMBERS: Ethan Christensen, Alan Kassab, Sanam Nagvekar, Sibi Radhakrishnan, Ryan Spohn, Michael Tran
 ADVISOR: Dr. Ahmad Bani Younes - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/5155511086>

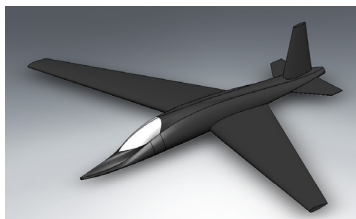


Illuminating Reflectometer Instrumentation and Spectrometer (IRIS Lunar CubeSat)

The Illuminating Reflectometer Instrumentation and Spectrometer (IRIS) Lunar CubeSat will examine the presence of water ice in permanently shadowed regions (PSRs) and the recently discovered ferric mineral hematite in close proximity on the moon's surface. IRIS will use powerful near infrared (IR) lasers to peer into the dark depths of PSRs while using a single aperture infrared spectrometer to investigate formations of hematite. This scientific research will ultimately help NASA's Artemis Moon Program.

Dynamico

MEMBERS: Alberto Reyes, Adan Mora, Brandon Hubbard, Josh Jeppesen, Nicole Lyon, Ram Bernardo
 ADVISOR: Geoffrey Butler - SDSU
 ZOOM LINK: <https://SDSU.zoom.us/j/86132621207>



Dynamico's ATP Aircraft

Team Dynamico has designed an advanced pilot training aircraft suitable for training domestic and international pilots, to include air-to-air encounters as well as ground attack missions. With requirements modeled after the USAF Advanced Pilot Training Program, our complete preliminary design includes mass properties and structural analysis, aerodynamics including stability and control, performance analysis, and development and fielding cost projections. These results, and a description of the unique aspects of our design, will be presented.

Montezuma's Revenge

MEMBERS: Zachary Cohn, Kendall Dizon, James Felix, Jacob Krugh, Brendan Lameiro, Collin Mandichak
 ADVISOR: Geoffrey Butler - SDSU Professor
 ZOOM LINK: <https://SDSU.zoom.us/j/83070875341>



CAS A-66 Eradicator

The A-66 was designed for a set of close air support missions that were outlined in a system requirements document that was given by Professor Butler for our senior design class. We then came up with the design of a canard aircraft to then complete the missions and meet all the requirements outlined in the system requirements document.

Rocket Appliances

MEMBERS: Mahmoud Alsharif, Leonel Canales III, Vic Canlas, Samantha Dotts, Wayne Maxwell, Julio Perez Carrillo, Daniel Woodman
 ADVISOR: Dr. Ahmad Bani Younes - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/84350704106>



LEO Debris Collection

This is a mission to send a swarm of satellites conforming to CubeSat specifications to track and collect debris in low-earth-orbit.

San Diego State Space Command

MEMBERS: Logan Donaldson, Aldair Herrejon-Andrade, Jordan Johnson, Rejiryc Perez, Basma Radwan, Dosa Ty, Trevor Williams
 ADVISOR: Dr. Ahmad Bani Younes - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/86867604145>

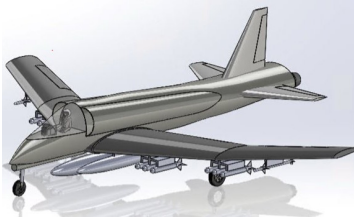


EcoSat

As aspiring aerospace engineers, our field of study revolves around designs that primarily focus on spacecraft, aircraft, missiles, satellites and many more. We have decided to dedicate our design into proposing a geostationary satellite over Africa that will help us gain more information on the aspects surrounding the continuous change greenhouse gases play into climate change.

Team SAJI

MEMBERS: Sara Brandt, Jonathan Davami, Arad Gerami, Andy Hernandez, Joshua Olson, Itzel Salgado, Sahil Trivedi
 ADVISOR: Geoffrey S. Butler - SDSU
 ZOOM LINK: <https://SDSU.zoom.us/j/89602118592>

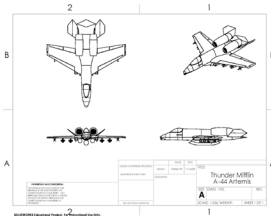


Close Air Support Aircraft Design

Team SAJI is developing a 60,000-pound, single-seat, twin turboprop, full-scale close air support aircraft. This aircraft will be designed to carry several thousand pounds of ammunition and travel at substantial range to a target, while maintaining key performance, stability, maneuverability, and survivability requirements. Through limited iterative design of our aircraft, we were able to modify certain aspects to achieve the mission requirements necessary which will advance modern day close air support aircraft.

Thunder Mifflin

MEMBERS: Diego Chavez, Julian De Leon, Spencer Hartmann, Reyno Renolayan, Gina Pagano, Adrien Wisch
 ADVISOR: Geoffrey Butler - SDSU
 ZOOM LINK: <https://SDSU.zoom.us/j/8997239255>

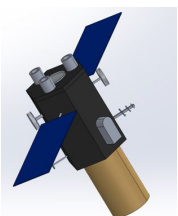


Design of a Close Air Support (CAS) Aircraft: The A-44 Artemis

Our senior design capstone project consisted of creating the A-44 Artemis, an all weather Close Air Support (CAS) aircraft that can replace the A-10 Thunderbolt II, more commonly referred to as the Warthog of The United States Air Force. The A-44 Artemis is capable of quickly entering hostile areas, loitering, and providing cover for friendly forces on the ground. The A-44 Artemis is capable of deploying lethal ordinance in close proximity to friendly forces and can then quickly leave the hostile area once its ordinance has been dropped and its mission over the target area completed.

Vornsand Systems

MEMBERS: Austin Chase, Tyler Felgenhauer, Jose Garcia II, Eric Maravilla, Luis Navarrete, Kanar Solaiman, Luis Solano
 ADVISOR: Dr. Ahmad Bani Younes - San Diego State University
 ZOOM LINK: <https://sdsu.zoom.us/j/2960031115>



SATlantis

Low earth orbit, short wave infrared earth imaging satellite.

Aligned Construction and Engineering (ACE)

MEMBERS: Zabdiel Flores, Andrew Ghosn, Brendon Guo, Taha Issa, Matthew Korkis, Noor Loqa
 ADVISOR: John Prince, Delane Engineering
 ZOOM LINK: <https://SDSU.zoom.us/j/88651977225>



Cristobal Lot Subdivision

The overall project objective is to subdivide and develop the lot for single family residences, while aiming to maximize the use and potential of the property. Furthermore, Project objective includes the preparation of new Parcel Maps for proposed subdivision and preparation of Phased Grading and Improvement Plans for the development.

Arete Engineering

MEMBERS: Isabel Bishop, Shane Cole, Flavia DePlachett, Philip Kist, Cole Saez, Chaston Stewart
 ADVISOR: John Prince - Delane Engineering
 SPONSORS: Engineering Design Group, Construction & AE Forensicsm Coastal Engineering Associates, Landmark Engineering Corporation
 ZOOM LINK: <https://SDSU.zoom.us/j/86356379465>



Cristobal Lot Subdivision

The Cristobal Dr. subdivision project occupies a section of land located in Spring Valley. The 1.12 acre parcel of land sits on various grades. The future purpose of the land is to maximize housing accommodations, considering ADU's. This project requires the use of geotechnical, land development, and stormwater engineering.

BoJack Engineering and Construction

MEMBERS: Rey Becerra, Alex Gonzalez, Kian Murray, Mario Orso, Rodrigo Soler, Julian Tobarsalas
 ADVISORS: Matthew Verbyla - SDSU Researcher, John Prince - Delane Engineering, Martha Miletic - SDSU Professor, Pedro Orso-Delgado - Under Construction Co
 SPONSORS: San Diego State University, California State University San Marcos, Michael Baker International, Caltrans, BoJack Engineering and Construction
 ZOOM LINK: <https://SDSU.zoom.us/j/84200173838>

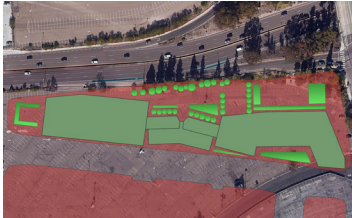


CSUSM Palm Canyon Drive Extension

The Palm Canyon Drive extension, a two-way road with roundabout intersections, will encompass a bike lane and sidewalks to offer climate-friendly pathways for the students on the campus. The implementation of green infrastructure and vegetation that is local to the region along the roadway will help to stabilize the climate and provide a living space for the wildlife. Additionally, our plans will include proposed building pads that will accommodate the University's vision for future developments in the area.

Centaur Solutions

MEMBERS: Saad Alabdullah, Mubarak Alhajraf, Mohammad Aljarrah, Salman Almutairi, Abdulrahamn Alrashidi, Corey Hutchison
ADVISOR: John Prince - Delane Engineering
ZOOM LINK: <https://sdsu.zoom.us/j/81912610376>



SDSU Mission Valley High-Rise Hotel

The project is in the mission valley area at 9449 Friars Rd. San Diego CA, 92108. It is the former location of Qualcomm/ Aztec Stadium and is currently serving as an additional parking lot for the SDSU West Project. The 3.8-acre area will eventually become a 9 story hotel that includes a conference room and a parking structure. SDSU West will serve higher education, the public good, and the community's goals and aspirations including NCAA Division 1 sports.

Eco Dynamics - Team 20

MEMBERS: Abdulrahman Al Ateeqi, Ahmed Alkhelaiwi, Abdullah Alrashed, Kevin Endo, Mia Preciado, Alyssa Mey Saechao
ADVISOR: Mark Filanc - San Elijo Joint Powers Authority
SPONSORS: Michael Thornton - San Elijo Joint Powers Authority
ZOOM LINK: <https://SDSU.zoom.us/j/81067359787>



SEJPA Stormwater Capture and Reuse

The San Elijo Joint Powers Authority (SEJPA) plans to implement a stormwater capture collection system around the existing wastewater treatment plant site, treat that collected water and pump the treated water to the existing treatment plant where it will be further processed for reuse.

Epic Engineering

MEMBERS: Shang Ahmad, Abdulmajeed Al Aboosi, Mohammad Alenezi, Husam Alkhoury, Olivia Huizar, Haroon Juhdi, Tristen Lopez
ADVISORS: John Prince, P.E., PMP, James Haughey, P.E., DBIA, LEED AP, Mark Filanc, P.E., DBIA
SPONSORS: MTS, City of San Diego
ZOOM LINK: <https://SDSU.zoom.us/j/84634386723>



Fenton Parkway Bridge

Epic Engineering is pleased to present our plan to provide engineering design solutions for developing the Fenton Parkway Bridge construction. In San Diego, Epic Engineering provides public agencies services, including civil engineering, structural engineering, construction engineering, transportation engineering, and geotechnical engineering services. Our firm can also provide services, such as Stormwater Treatment and Traffic Development.

Horizon Engineering

MEMBERS: Alawadhi, Albasairi, Alhathal, Alhouti, Alshumais, Buhamdi
 ADVISOR: John Prince - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/81593404142>



Cristobal Lot Subdivision

The aim of this project is to develop single-family residences that accommodate most of their needs and maximizing the lot.

Innovation Engineering Center

MEMBERS: Aiman Alanjari, Lujain Aldabi, Omar Almatar, Mansor Alqaloshi, Salem Alroumi, Abdullah Altabtabaei, Joshua Stuedler
 ADVISOR: James Haughey - San Diego State University
 ZOOM LINK: <https://sdsu.zoom.us/j/87400985652>



Fenton Parkway Bridge

A bridge design starting from Camino Del Rio N, and over the San Diego River connecting it to Fenton Parkway creating an easier and faster transportation route.

Jump Street Engineering Inc.

MEMBERS: Yun Chiang, Tim Fontimayor, Marvin Luluquisen, Enrique Naputi, Axel Rinder, Enrico-Joaquin Santos
 ADVISOR: Mark Filanc - Filanc Construction
 SPONSOR: Gary Silverman - Filanc Construction
 ZOOM LINK: <https://SDSU.zoom.us/j/86809262241>



Escondido MFRO Booster Pump Station

The project proposes to develop a booster pump station located in the City of Escondido. The pump station houses a mechanical and pump room along with an electrical room. In addition to the booster pump station, Jump Street Engineering Inc. will design a recreation center that includes an indoor basketball court, a concession stand, and restrooms for the city of Escondido community.

Modern Design Company

MEMBERS: Abdullah Alghanim, Abdullah Alhazza, Abdullah Almailam, Bibi Almulaifi, Sabiha Alzayed, Zaina Marafi
 ADVISOR: James Haughey - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/84990729017>



Fenton Parkway Bridge

Building a bridge that connects the roadways of Fenton Parkway to Camino Del Rio North while making the appropriate adjustments to said roadways such as adjusting road markings and adding road signs and signals.

Osprey Construction, Inc.

MEMBERS: Greg Jones, Daniel Koopmans, Jordan Rodriguez, Justin Sloman, Blake Stelzer
 ADVISOR: Mark Filanc, Filanc Construction
 ZOOM LINK: <https://SDSU.zoom.us/j/88666254824>



Escondido MFRO Booster Pump Station

The city of Escondido's effluent pump is not able to supply the desired flow rate to the distribution reservoir, east of town. Osprey Construction Inc. will design a booster pump station in order to add energy in the form of pressure into the system, thus, meeting the flow requirements of the agricultural community. The booster pump station will be located at the Mountain View Park (corner of Citrus Ave. and Glenridge Road).

PHEBBZ LLC.

MEMBERS: Jessica Brents, Lara Butrus, John Esho, Zain Hana, Johana Press, Ranya Zina
 ZOOM LINK: <https://SDSU.zoom.us/j/84275893140>



SDSU Mission Valley High-Rise Hotel

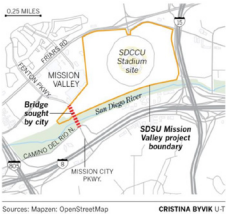
Through our design we hope to create a hotel that fits harmoniously with the surrounding environment. With the guidance of San Diego State University's plan we are proposing to create a nine story hotel with an accompanying parking structure. This includes a 150 ksf parking structure, 55 ksf first floor, and 8 13,000 sqft floors above. Our design of the structures is created in a way to maximize environmentally friendly landscaping and minimizing the footprint of the necessary structures.

Pinnacle Innovations

MEMBERS: Mikel Ciafre, Roman Gonzalez, Erika Kenion, Jacobo Velasco, Nicholle Willis, Ross Wong

ADVISOR: Jim Haughey Michael Baker

ZOOM LINK: <https://SDSU.zoom.us/j/84757078788>



Fenton Parkway Bridge

The Fenton Parkway bridge is an addition to the SDSU West Campus Development, connecting the southern end of Fenton Parkway to Camino Del Rio North. Currently the road ends at Fenton Parkway Trolley Station - behind Ikea - at Fenton Marketplace, adjacent to SDSU West Campus. This much-anticipated bridge will provide a North to South route not subject to flooding over the San Diego River.

ProAqua Solutions

MEMBERS: Ellyn Brouillete, Katarina Coss, Jake Giovanni Hester, Tommie Post

ADVISORS: Dr. Christy Dykstra - San Diego State University Department of Civil, Construction, & Environmental Engineering

ZOOM LINK: <https://SDSU.zoom.us/j/86436466609>



Micro and Nanoplastic Removal at the Point Loma Wastewater Treatment Plant (PLWWTP)

Many wastewater treatment plants in San Diego and California make efforts to remove micro and nanoplastics (MNPs) or have existing filtration processes that remove MNPs; however, the modified discharge requirements for the PLWWTP facilitates the discharge of MNPs into the ocean. Moreover, some treatment processes may be ineffective in removing MNPs or may even increase levels of MNPs in discharged wastewater. Thus, the team shall select and design an appropriate solution to cost-effectively reduce the discharge of MNPs.

Professional Engineering Office

MEMBERS: Albahar Shamlan, Albahar Mesharee, Alfawaz Ebrahim, Alotaibi Mohammed, Alqudhaibi Mohammed, Alsafran Abdulaziz

ADVISOR: Mark Filanc - San Diego State University

ZOOM LINK: <https://SDSU.zoom.us/j/3645540293>

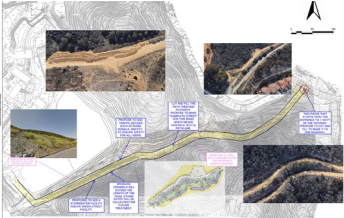


SEJPA Stormwater Capture and Reuse

The project consist of collecting data on the stormwater flows in the selected area and developing a diversion structure, pump station, and pipeline to the existing treatment plant. Additionally, creating a detailed project schedule and a detailed cost estimate also developing a Storm Water Pollution Prevention Plan (SWPPP) for all construction activities associated with the project.

Rainy Day Engineering Group

MEMBERS: Jalal Daabas, Abdullah Harami, Rick Patton, Gabriella Perez, Maryann Soriano, David Ta
ADVISOR: John Prince - Delane Engineering Inc.
ZOOM LINK: <https://SDSU.zoom.us/j/7280545814>



CSUSM Palm Canyon Drive Extension

CSU San Marcos has undergone massive amounts of growth in its programs and student population since it was founded in 1989. In order to facilitate an influx of more students and faculty each year, the college plans to construct a variety of buildings along its south side. An approximately 3,000 ft. long road will be built in order to extend Palm Canyon Drive to La Moree Road. This road will serve as a new inlet and outlet for the campus' southern development.

RWR Engineering

MEMBERS: Husain Alamir, Ebrahim Alshatti, Ali Ashkanani, Kilian Colin, Danah Mohammad, Jason Simmons
ADVISOR: Mark Filanc - SDSU
SPONSOR: Michael Thornton - SEJPA
ZOOM LINK: <https://sdsu.zoom.us/j/83302489526>



SEJPA Stormwater Capture and Reuse

This project consists of designing a capture and treatment of stormwater from the existing channel to store or treat at the SEWRF. RWR Engineering will design a diversion structure, ponds in series/basin, and select a low and high flow pump. This project will be helpful towards the future of the water in California.

SB&P Engineering

MEMBERS: Mia Banducci, Derek Bucholtz, Taylor Patrick, Noble Schlueter, Marcos Sena
ADVISOR: Gary P. Silverman, PE, BCEE, DBIA - J.R. Filanc Construction Company, Inc.
ZOOM LINK: <https://SDSU.zoom.us/j/82348555927>

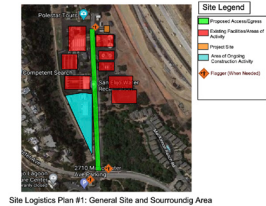


Escondido MFRO Booster Pump Station

MFRO Booster Pump Station with a family bathroom in Mountain View Park.

S.SAAC Construction

MEMBERS: Aarron Aitchison, Jacob Andrews, Eva Curiel Muzquiz, Laura Serrano, Claudia Soto-Alfaro
ADVISOR: Mark Filanc - J.R. Filanc Construction Company, Inc.
ZOOM LINK: <https://SDSU.zoom.us/j/4938609992>

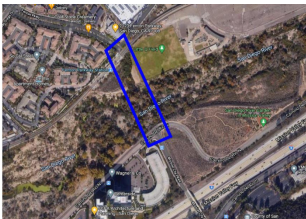


San Elijo Cogeneration Facility

The San Elijo Wastewater Treatment Plant treats sanitary waste from different areas, including towns of Encinitas, Solana Beach, and Del Mar. During the treatment process, the sludge byproduct is further treated through anaerobic digestion which generates a significant quantity of methane gas. The methane gas is currently being flared out, so there is a need to design a system and installation of a new facility to treat methane gas with a self-sufficient engine generator.

Steel Going Strong Engineering

MEMBERS: Vicente Buenrostro, Martin Flores, Dominic Huerta, Gabriel Lopez, Wayne Thorn, Nathan Whitmore
ADVISOR: James Haughey - Michael Baker International
ZOOM LINK: <https://SDSU.zoom.us/j/6485729032>



Fenton Parkway Bridge

Our team was tasked with designing a cost-efficient and functional support bridge spanning over the San Diego River to enhance traffic from the Fenton Pkwy. & Northside Dr. junction to the Camino Del Rio & Mission City Pkwy. intersection. This project required a site study, traffic study, geotechnical study, storm water analysis, and structural analysis. We designed to minimize any intrusion into the fragile San Diego River watershed.

Sunset Engineering

MEMBERS: Mark Alvarado, Kylee Nakata, Alyssa Palermo, Alex Tang, Zac Taylor, Jack Walker
ADVISOR: Mark Filanc - J.R. Filanc Construction Company, Inc.
SPONSOR: Michael T. Thornton - San Elijo Joint Powers Authority
ZOOM LINK: <https://SDSU.zoom.us/j/85737811121>



SEJPA Stormwater Capture and Reuse

The project consists of gathering data of the stormwater flows, developing a diversion structure, treatment plant, and pump station and pipeline to the existing treatment plant. A design criteria as well as a location for the new facilities must be worked out with owner. Additionally, a detailed project schedule as well as a detailed cost estimate must be developed.

T16 Design and Construction

MEMBERS: Fabian Aguilera, Michael Dedekind, Ismael Delgado, Lucas Kjeldsen, Joe Maulhardt, Max Perlin

ADVISOR: James Haughey - SDSU

ZOOM LINK: <https://SDSU.zoom.us/j/89451843594>



Skyline Fire Station 51

Generate drawings and documents necessary in the design and construction of Skyline Fire Station 51. The fire station facility will approximately be 10,700 square feet and 2-3 stories. T16 is a design build firm and will have construction services, while still providing in-depth engineering plans. This team will provide construction phasing, site Logistics, construction scheduling, and a construction cost estimate as well as a detailed site logistics and construction access plan.

Turtle Engineering

MEMBERS: Matthew Fredrickson, Jacob Lauricella, Cody Merritt, Jake Stevens, Spencer Stone

ADVISORS: Jim Haughey - San Diego State University

ZOOM LINK: <https://SDSU.zoom.us/j/81328436590>



Skyline Hills Fire Station 51

To provide design & engineering services in order to build a 25,000 sq. foot Fire Station. About 8,000 square feet of the current lot will be used for the 2-story Skyline Hills Fire Station, which is estimated to have a total building square footage of 11,000 square feet. The remaining area will be used for a parking lot and landscaping. This project will dip into all aspects of engineering mainly focusing on civil, storm water, structural & geotechnical expertises.

West Coast Engineering

MEMBERS: Jesse Babauta, Josef Barho, Aylen Duran, Micah Kawano, Zach Parella, Jackie Villanueva

ADVISOR: Tom Zink, SDSU

ZOOM LINK: <https://SDSU.zoom.us/j/86933767891>



CSUSM Palm Canyon Drive Extension

Developing a road design for an extension road on CSUSM campus and grading of future building pads.

Zoom Zoom Construction Co.

MEMBERS: Brandon Bongcaron, Collin Killins, Cameron Lapu'Aho, John Nguyen, Cameron Olivo, Roman Palo
ADVISOR: James Haughey - Michael Baker International
ZOOM LINK: <https://SDSU.zoom.us/j/84195460244>



Skyline Hills Fire Station 51

Team 14 has the responsibility of proposing on the project of developing the Skyline Hills Fire Station 51. With an existing operational fire station on site, Team 14's role is to produce engineering documents through an appropriate analysis of the site and to create a design that adheres to the client's requirements.

DIGIMUSER

MEMBERS: Suaod Alhajry, Luke Kennard, Angel Martinez, Danielle Stewart, David Pierce Walker-Howell
 ADVISOR: Professor Ken Arnold
 ZOOM LINK: <https://sdsu.zoom.us/j/81423002677>



DIGIMUSER - Vocal Effects Processor

DIGIMUSER is a digital vocal effect processor “stompbox” that applies a variety of real-time signal processing algorithms to alter the voice of a singer. DIGIMUSER uses a microcontroller and user controls to digitally apply vocal effects such as filters, delays, distortions, and modulations. DIGIMUSER takes a standard dynamic microphone as input and outputs to an amplifier or additional audio processing devices. To put it simply, DIGIMUSER gives anyone an entire effects studio right in the palm of their hand.

Group 14 - Remote Lab

MEMBERS: Bashar Alali, Larissa Almendares, Shoya Ito, Armaan Kafaipour, Muiz Kareem
 ADVISOR: Ken Arnold - SDSU
 SPONSOR: Ken Arnold - HiTech EdVentures
 WEBSITE: <http://mydeskbenchsdsu.me/>
 ZOOM LINK: <https://SDSU.zoom.us/j/89111472943>



My Desk Bench

The current pandemic of COVID-19 has brought a halt to in-person instruction for both lectures and labs. As a consequence, students can no longer participate in hands-on labs, losing the real-world experience of having to set up and troubleshoot their lab equipment. My Desk Bench enhances both the experience of remote labs and a student’s learning by providing some missing functionalities or tools of in-person labs. It is intended to serve ECE students taking digital circuits and electronic labs.

HELIOS

MEMBERS: Eissa W M A A Boland, Romilene Cruz, Stephen Malolepszy, Juan Carlos Orlando, Attila Rakosi
 ADVISOR: Ken Arnold - SDSU
 SPONSOR: Ken Arnold - HiTech EdVentures
 ZOOM LINK: <https://SDSU.zoom.us/j/85731264734>



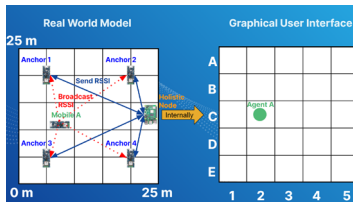
Energy Management System

Helios gives smaller consumers the opportunity to use an energy management system that large corporations utilize. It maximizes consumer profits with peak shaving and plans ahead for future weather conditions. Power usage is monitored with CAISO and weather conditions are pulled from OpenWeather. Helios will be able to intelligently switch between using power stored in batteries or power from the grid depending on the algorithm.

Here’s to a greener future! See you there.

Location Tracking Through Bluetooth Low Energy

MEMBERS: Leo Chatterton, Hada Marabeh, Tristan Richmond, Zach Rocha, Sri Harsha Shatagopam
 ADVISOR: Dr. Baris Aksanli - San Diego State University
 SPONSOR: Antony Brock - Transportation Security Administration
 WEBSITE: <https://sites.google.com/view/ble-location-tracking/home>
 ZOOM LINK: <https://sdsu.zoom.us/j/8586274329>



Location Tracking Through Bluetooth Low Energy

Location tracking within a building is difficult with GPS or similar technologies; our team offers an indoor location-tracking solution through the use of Bluetooth Low Energy (BLE). Within a predefined grid, we make use of mobile and anchor nodes that send RSSI values that serve as the input to a machine learning algorithm, which predicts the location of the mobile node based on said RSSI values. A GUI is used to visualize the mobile node's location every 10 seconds, with the ability to replay past locations.

Makyo Hyosho

MEMBERS: Enes Basbug, Eduardo Cadena, Glorianne Francavilla, Brandon Lee, Angelo Dominic Navarro
 ADVISOR: Dr. Hakan Toreyin - San Diego State University
 ZOOM LINK: <https://SDSU.zoom.us/j/89017801896>

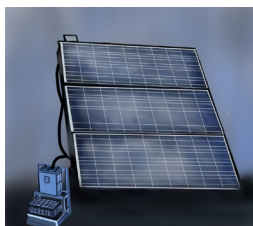


Smart Mirror

Our goal is to design a smart mirror that makes everyday life a bit easier whether that is through putting all your notifications in one place or as an entertainment center. Features include: an LCD screen displaying notifications such as weather and stocks, an intercom system, clap activated lights, and built in speakers with corresponding music reactive LED strips. The Smart Mirror embodies the idea of technology providing numerous functions to simplify and entertain individuals, all in one centralized place.

Maximum Power Point Tracker

MEMBERS: Daniel Baltazar, Travis Blake, Ryan Dial, Keelan Gloria, Anne Vu
 ADVISOR: Ken Arnold - HiTech EdVentures
 ZOOM LINK: <https://SDSU.zoom.us/j/81595124719>

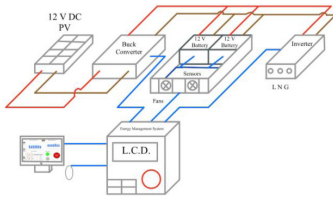


Maximum Power Point Tracker

The MPPT will extract the maximum amount of power from a photovoltaic (PV) solar panel and provide the user with a constant voltage under various weather conditions. While tracking voltage and current from the input and output, the system will monitor ambient temperature and irradiance conditions and update the user via a TCP socket interface.

Renewable Energy - Micro Grid

MEMBERS: Cristian Borquez, Matthew Clark, Daniel Ghanim, Jamilla Thomas, Benjamin Tran, Eric Valle
 ADVISOR: Dr. Chris Mi - SDSU
 SPONSOR: Sam Bustillos - SDG&E
 ZOOM LINK: <https://sdsu.zoom.us/j/82209469339>



SDSU Solar Battery System

This project demonstrates a renewable microgrid which consists of an independent, rechargeable battery storage and a solar PV charging system. The system supplies power to DC and AC loads. The battery is charged by the solar panel, and monitored by a microcomputer. The sensors' data is stored and processed through the microcomputer which can be used to display system information to the user through a laptop or on its integrated screen.

RUN DMC

MEMBERS: Lucas Adams, Ahmad Alawadhi, Cody Allen, Ghazlan Fagerah, Surendra Mahida, Conan Poppe
 ADVISOR: Barry Dorr - SDSU
 SPONSOR: Self Sponsored
 WEBSITE: <http://digitalmc.info>
 ZOOM LINK: <https://SDSU.zoom.us/j/82603839030>

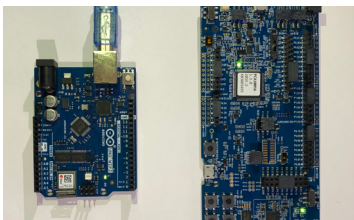


Digital Motor Controller

Motor Control is a challenge for many people taking on their first projects. Our team has designed a digital motor control that will allow a user to set the speed of a low voltage brushed DC motor and then the controller will maintain that speed even when the motor meets resistance. Think of it like cruise control for a small motor. Our team built this controller as an example for future students to follow when they decide to use motors in their own projects.

Team Timerzzz

MEMBERS: Danielle Drinko, Gary Tong, Cesar Oliva, Liam Weinfurter
 ADVISOR: Dr. Yusuf Ozturk - SDSU
 SPONSOR: Antony Brock - Transportation Security Administration
 ZOOM LINK: <https://SDSU.zoom.us/j/81919739511>



TSA Security Timers

This system will allow the Transportation Security Administration (TSA) to measure wait times in screening queues. It uses a Bluetooth Low Energy (BLE) system consisting of beacon devices and anchors. Beacons are given to and carried by airline passengers when they enter the TSA security line. Each beacon will record the time it takes for a passenger to pass through the line. Once the beacon is returned to TSA, it will transmit time start, time end, and overall time elapsed to anchor devices with WiFi capability that will host the data for TSA to monitor average security waiting times.

Team Tired

MEMBERS: Andrew Birn, Fadi Georges, Shan Kureshy, Alkawther Mirza, Arman Shah
ADVISOR: Dr. Baris Aksanli - SDSU
SPONSOR: Transportation Security Administration
ZOOM LINK: <https://SDSU.zoom.us/j/7291630895>



Tired Tracker

The Tired Tracker device was created as a proof of concept to the Transportation Security Administration (TSA) for a centralized system to allow users to view their fatigue level in real time by recording biometric data and transmitting it to an Android application over Bluetooth. The physical device consists of a small wearable embedded system strapped to the user's wrist which collects body temperature, heart rate, and arm motion data in a non-intrusive way. An accompanying app analyzes the data and displays the user's fatigue level on a scale of 1 (low) to 10 (high).

A Better Breath

MEMBERS: Victor Guzman, Brandon Hoang, Ryan Malone, David Nikiforov, Nathan Pennington, Faud Siraj, Sophia Smith, Breanna Tang, Raven Tomas, Tyler Young

ADVISORS: Dr. Scott Shaffar, SDSU and Professor Barry Dorr, SDSU

SPONSOR: SDSU Mechanical Engineering

ZOOM LINK: <https://SDSU.zoom.us/j/5855617124>



Face Mask With Active Virus Control

This team has designed an innovative facemask that incorporates a UV light sterilization system coupled with a filter to inactivate airborne pathogens including SARS-CoV-2.

Auto H2O

MEMBERS: Nathan Behymer, Ahmed Bohamad, Alberto Gomez-Flores, Lydia Keaty, Nguyen Pham, Erick Pompa, Ivan Santana, Stephanie Suarez, Mohamad Zeidan

ADVISORS: Professor Barry Dorr, SDSU and Dr. Scott Shaffar, SDSU

SPONSOR: Professor Barry Dorr

WEBSITE: <https://autoh2o.wixsite.com/teampage>

ZOOM LINK: <https://SDSU.zoom.us/j/88590793734>



Automatic Acoustic Water Bottle Filling Station

The objective of this project is to design, fabricate and demonstrate a water bottle refilling station that eliminates water spillage normally encountered with traditional stations. The station employs an infrared sensor to detect a bottle, along with a microphone that detects a predetermined rate of change in the cavity resonance frequencies providing key information on when the bottle is full. Once the signal is detected indicating a full bottle, a microcontroller automatically shuts off the flow of water thus preventing overflow.

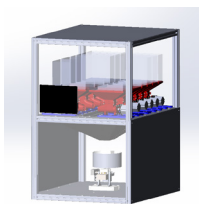
Aztec Granola Factory

MEMBERS: Antonio Avila Ramirez (ME), Joseph Dawisha (ME), Mark-yves Gaunin (ECE), Marc Gordon (ME), Winston Liew (ECE), Austin McElrone (ECE), Ezra Simpson (ME), Sudarshan Suresh Babu (ECE), Naomi Tewolde (ECE)

ADVISORS: Dr. Scott Shaffar, SDSU, Professor Barry Dorr, SDSU, Mark Bruno, SDSU, Dusty Fisk, D&K Engineering, and Dr. Ying Khai Teh, SDSU

SPONSOR: D&K Engineering

ZOOM LINK: <https://SDSU.zoom.us/j/89084963313>



Granola Kiosk

There is no vending machine on the market that automatically dispenses a custom granola mixture. This kiosk will allow the user to choose from a variety of granola bases and toppings through a user interface and have the ingredients mixed and delivered to them. Aztec Granola Factory is tasked with designing and manufacturing the architecture and all the major subsystems of the kiosk. This includes the 80/20 frame, ingredient storage containers, dispensing valves, and mixing/measurement mechanism.

Drone Force One

- MEMBERS:** Brian Balsama, Rominique Borja, Blake Downey, Nick Fazio, Luke Larochelle, Christian Moreno, Isaiah Pico, Perla Ramirez, Arturo Urbano, Lilian Vu
- ADVISORS:** Dr. Scott Shaffar, SDSU, Professor Barry Dorr, SDSU, Dr. John Wood, Naval Information Warfare Center Pacific, and Dr. Thad Welch, Boise State University
- SPONSORS:** US Department of Defense, National Security Innovation Network
- ZOOM LINK:** <https://SDSU.zoom.us/j/85931692011>



USAF Counter Unmanned Aerial System (Drone) Solution

This team was tasked by the USAF at Ellsworth AFB to alert the security team at the base of an unmanned aerial vehicle (UAV) intrusion into the Ellsworth operational airspace. This team has designed a counter-UAV system capable of detecting the acoustics emitted by multi-rotor drones. In order to provide year-round surveillance, the system has been designed to utilize solar power and operate during the possible harsh weather conditions in South Dakota.

Mean Green Growing Machine

- MEMBERS:** Ali Alqaoud, Jose Baez, John Berger, Abigail Dabu, Daniel Kenner, Max Merritt, Thuyavan Sathiamurthi, Conor Vasiliadis, Elias Wooten
- ADVISORS:** Dr. Scott Shaffar, SDSU and Professor Ken Arnold, SDSU
- SPONSOR:** SDSU Zip Launchpad
- WEBSITE:** <https://atomgreens.com>
- ZOOM LINK:** <https://SDSU.zoom.us/j/83046132671>

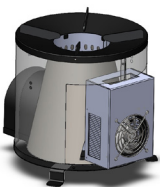


Automated Microgreens Growing Environment

Automated microgreens growing appliance: designed to provide daily access to affordable microgreens. The project aims to provide the ideal growing environment for microgreens regardless of its surroundings. To achieve this our team developed an integrated controls system that oversees the watering, lighting, and climate of the growing environment through various electromechanical actuators, sensors, and custom PCB's. To ensure a consistent supply of microgreens to the user the device can grow up to five varieties.

The Stovetastics

- MEMBERS:** Alyaa Alkharji, Josh Birkett, Agustin Cedeno-Rodriguez, Joel Edquiban, Sophia Nitkey, Jason Schwartz, Alexander Sprague, Reve Zumarraga
- ADVISORS:** Dr. Scott Shaffar, SDSU and Dr. Ying Khai Teh, SDSU
- SPONSORS:** Hi-Z Technology, Inc. and Mr. Stan Miller
- ZOOM LINK:** <https://SDSU.zoom.us/j/81351940271>



Thermoelectric Module-based Cookstove

This senior design project is tasked to design and build a Tier 4 approved, bio-fueled cook stove that incorporates Hi-Z's thermoelectric technology to support two fans and electrical outlet. The cookstove is to be deployed to third world countries to families that use biomass as their main source of fuel. The purpose is to reduce emissions, improve efficiency and create a source of electricity in areas that have limited access to power. The system comes equipped with data logging technology to display temperature and CO.

Team ARES

MEMBERS: Humood Alghunaim, David Bunson, Alan Clemenson, Jesus Figueroa, Matthew Gonzalez, Jonathan Maravilla, Ryan Marmion, Brandon Mosburg, Krysta Rhodes

ADVISORS: Dr. Scott Shaffar, SDSU and Professor Barry Dorr, SDSU

SPONSOR: NASA

ZOOM LINK: <https://SDSU.zoom.us/j/85120542970>



Aztec in-situ Resource Extraction System

The ARES system is SDSU's submission to NASA's 2021 RASC-AL Moon to Mars Ice Prospecting Challenge with the goals of developing technologies capable of extracting water on the Moon and Mars and advancing the critical knowledge needed to further solar system exploration. ARES was designed as a prototype capable of extracting water from ice deposits buried beneath simulated lunar or Martian soil, identifying and mapping subsurface layers, and extracting water from a 600-pound ice block in a simulated off-world test bed.

Team Argus

MEMBERS: Nicholas Balagtas, Joshua Barnard, Blake Borskey, Koa Cabling, Donnel Endaya, Raylan Jasec Gonzales, Paul Vincent Guiriba, Jakob Lepur, Henry Segura

ADVISORS: Dr. Scott Shaffar, SDSU, Professor Barry Dorr, SDSU and Mr. Michael Hard, NSIN

SPONSOR: US Department of Defense, National Security Innovation Network

ZOOM LINK: <https://SDSU.zoom.us/j/84227291384>



USMC Small Ground Sensor

To create a small ground sensor capable of covertly monitoring remote areas in real-time with wireless user accessibility. Marines require a networkable, lightweight, disposable and user-friendly device that is capable of monitoring an evolving battlespace. These ground sensors shall be dispersed by hand along key locations to detect possible adversaries by methods of acoustics, visuals and motion. This device shall provide key information to the consumer to aid in their decision-making.

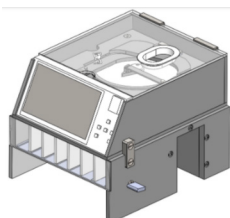
Team Pharmhouse

MEMBERS: Musaed Albaghdadi, Naser Alfaresy, Jacob Martinez, Chandler Meziere, Sean Myers, Tony Nguyen, David-Paul Sabado, Jeff Smith, Micah Spence, Jennifer Thai

ADVISORS: Dr. Scott Shaffar, SDSU, Professor Barry Dorr, SDSU and Ms. Annemarie Orr, QL+

SPONSOR: Quality of Life Plus

ZOOM LINK: <https://SDSU.zoom.us/j/82394624925>

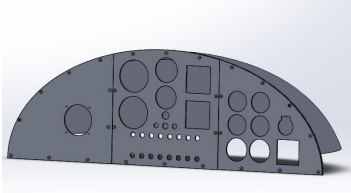


Automated Prescription - Pill Dispenser

Team Pharmhouse will design and manufacture a pill dispenser that will be able to distribute a desired amount of pills to their respective days in both weekly and monthly pill organizers, including am and pm weekly containers. The dispenser will also be able to be compatible with pills of a variety of shapes and sizes, as it is common for users to take multiple unique pills per day. The design will accommodate users with impairments such as arthritis, colorblindness, and various upper extremity issues.

Ace Gyro Designs

MEMBERS: Kris Ashley Gallardo, Brendan Good, Callie Johnson, Sam Reilly
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Charles Tucker, PRA
 SPONSOR: Popular Rotorcraft Association
 ZOOM LINK: <https://SDSU.zoom.us/j/86598967673>

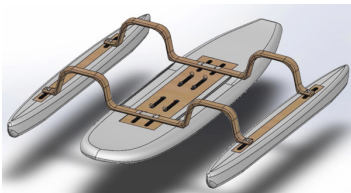


Gyroplane Instrument Panel

The RAF 2000 gyroplane, which was designed in the 1980's, possesses various design flaws. The PRA has requested that some mechanical flight instruments be replaced with an electronic flight information system (EFIS) resulting in a hybrid instrument panel. Our team has been tasked with designing an instrument panel that supports the EFIS and integrates a fuel flow totalizer system.

Adaptive Flow

MEMBERS: Brandon Do, Charles Malnar II, Lambert Soto, Christopher Tran Rojas
 ADVISORS: Dr. Scott Shaffar, SDSU, Ms. Annemarie Orr, QL+, and Amy Lagera, Adaptive Freedom Foundation
 SPONSOR: Quality of Life Plus
 ZOOM LINK: <https://sdsu.zoom.us/j/86403742511>



Adaptive Freedom Foundation Wheelchair Adaptive Stand-Up Paddleboard (WASUP)

Quality of Life's Challenger Adaptive Freedom Foundation uses an existing fleet of Wheelchair Adaptive Stand Up Paddle boards (WASUP) that have various issues and require a new solution. Team Adaptive Flow has designed and engineered a new WASUP system which accommodates 800 pounds while maintaining stability, strength, maneuverability, and welcomes all athletes. The system achieves these goals while maintaining a traditional and sporty aesthetic. Adaptive Flow's WASUP allows easy assembly and hopes to create smiles one athlete at a time.

Aero Power Tower

MEMBERS: Jeffrey Burrows, Daniel Elerding, Zachary Lang, August Stegman
 ADVISORS: Dr. Asfaw Beyene, SDSU ME and Dr. Scott Shaffar, SDSU ME
 SPONSOR: SDSU Mechanical Engineering
 ZOOM LINK: <https://SDSU.zoom.us/j/87648189005>

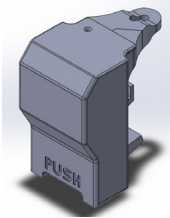


Remote Controlled Vertical Axis Wind Turbine

Demand for renewable energy has led to an increase in wind power research. This project includes design, analysis, and subsection testing of a 60 ft turbine tower that may be ultimately constructed and used for research at SDSU's Brawley Campus in the future. The tower is designed to bear a 10 KW horizontal axis wind turbine while simultaneously accommodating two 1kW or less vertical axis turbines. Testing a tower subsection serves to validate finite element analysis results and refine manufacturing/assembly plans.

All Weather Trash

MEMBERS: David Arushanyan, Hector Cea, Jacob Hoppe, Collin Vizina
 ADVISORS: Dr. Scott Shaffar, SDSU and Ms. Loretta Vega & Mr. Todd Pallas, USAF
 SPONSORS: US Department of Defense - National Security Innovation Network
 ZOOM LINK: <https://SDSU.zoom.us/j/83923153201>



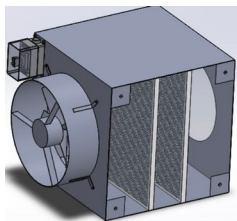
USAF Windproof Trash Can

Trash cans are not typically built to stand in high wind conditions, causing them to knock over and spill out all the garbage into the environment. The high winds at Ellsworth AFB knock the bins over and spread the trash across the base. Not only is the trash unsightly, it also has the potential to damage the aircraft on base.

The lids of the trash cans need to stay secured when tipped over in high wind conditions, but should also be user friendly for the refuse company to dump the trash out.

BADE

MEMBERS: Yasmeen Alshiyokh, Alex Bogardus, Justin Escoto, Isaac Diaz
 ADVISOR: Dr. Scott Shaffar, SDSU
 SPONSOR: SDSU Mechanical Engineering
 ZOOM LINK: <https://sdsu.zoom.us/j/9086340525>



The SDSU Design Studio (EIS-106B) Air Filtration System

The current problem is that the ventilation in the EIS-106B lab needs much improvement to provide quality air flow and exchange. As it continues to be affected with the toxicity that is produced when running the laser cutting machine, 3D printer, and other tools. In response, an HVAC system is to be implemented inside the room to filter all toxic chemicals that flow within the room.

The team was required To study the current system, to improve the filtration, and the air exchange through design recovery.

The Bomb Squad

MEMBERS: Celine Garcia, Kyle Mahoney, Dillon Sansom, Corey Sizemore
 ADVISORS: Dr. Scott Shaffar, SDSU, Mr. Michael Hard - National Security Innovation Network, and Mr. Anthony Ferraro - US Navy
 SPONSOR: US Department of Defense - National Security Innovation Network
 ZOOM LINK: <https://SDSU.zoom.us/j/84315122194>

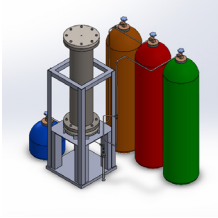


USN Next Generation Bomb Hoist

The HLU-288/E Bomb Hoist is the current hoist being used by both the Marine Corps and Navy. This hoist is not time efficient while loading and downloading ordnance and other mission equipment. The purpose of this project is to develop a manually operated bomb hoist that is more time efficient than the current hoist, while also maintaining lightweight, durability, and safety requirements. This design must utilize multiple gear ratios to be switched between based on the weight of the ordnance to maximize loading speed.

Carbon Creations

MEMBERS: Ali Alqattan, Ricardo Camacho, Brandt Walton, Cesar Telles, Edward Tomassone, Brandt Walton
 ADVISORS: Dr. Fletcher Miller, SDSU and Dr. Scott Shaffar, SDSU ME
 SPONSOR: SDSU Mechanical Engineering
 ZOOM LINK: <https://SDSU.zoom.us/j/81968088505>

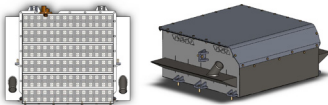


Carbon Particle Generator

Currently, Carbon particle generators use gaseous fuels like methane which are not as efficient as liquid fuels such as decane in generating carbon microparticles for solar energy absorption. Our project will utilize a laminar flame burner in combination with a pressure chamber to pyrolyze decane into carbon and hydrogen. The carbon that has been generated will be used to increase the efficiency of a solar based power generation system.

The Cool Guys

MEMBERS: Kevin Alcorn, Ryan Beighlie, Kyle Hicks, Jack Mohr
 ADVISOR: Dr. Scott Shaffar, SDSU
 SPONSOR: SDSU Aztec Electric Racing
 ZOOM LINK: <https://SDSU.zoom.us/j/85654576364>



SDSU Aztec Electric Racing (AER) Accumulator (Battery Pack) Cooling System

The objective of this project is to actively control the temperature of the batteries in the AER's racecar to prevent overheating in extreme conditions. The design includes an accumulator container with an integrated liquid immersion cooling system.

CryoSAMP

MEMBERS: Sarah Corduan, Prince Glick, Aldo E. Quintana, Mario Vazquez Garcia
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Andrew Simmons, Northrop Grumman
 SPONSOR: Northrop Grumman Corporation
 ZOOM LINK: <https://SDSU.zoom.us/j/88643346941>

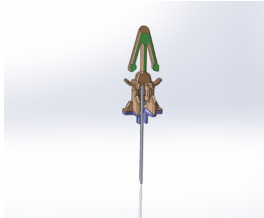


De-Icing System for Composite Leading Edges

Ice-formation on the leading edges of an aircraft is an issue that affects the aerospace industry. Recently, there has been an increased usage of composite structures, but the thermal limits of these materials are much lower relative to more traditional aluminum structures. Therefore, a reliable means for removing ice formation is needed. This system includes heating wires embedded in the composite layers with the addition of expanded graphite to the epoxy matrix in order to increase its thermal conductivity.

Dexcom Dream Team

MEMBERS: Casey Fischbach, Sonia Goetschius, Maria Morgan, Gilbert Angel Munoz
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Lenny Barbod, Dexcom
 SPONSOR: Dexcom
 ZOOM LINK: <https://SDSU.zoom.us/j/87875785575>



Dexcom Needle Hub Feasibility

The team has developed and performed feasibility of a new needle hub design for the next generation Dexcom device, consisting of a snap-in needle design that is more straightforward, significantly cheaper, easier to manufacture, and enables a decrease in technical failures, thus being more reliable and efficient.

Diamond Engineering Group

MEMBERS: Alexander Chung, Peter Love, Robert Mumma, Daniel Schneider
 ADVISORS: Dr. Scott Shaffar, SDSU, and Mr. Michael Hard - National Security Innovation Network
 SPONSOR: US Department of Defense
 ZOOM LINK: <https://sdsu.zoom.us/j/6310284599>



Manos Rucking Pack

Our project goal was to develop a modular rucksack with an adjustable frame that has the ability to maintain its integrity through all missions faced by the U.S. Marine Corps 1st Reconnaissance Battalion. Our solution was the Jack pack, named after a Marine who served in the Vietnam War, this pack is every bit as resilient and ready for combat as the marines who will be utilizing the pack.

The Flying Fish

MEMBERS: Matthew Larsen, Erin Mar, Tyler Rhoads, Jona Mae Tagaca
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Charles Norris
 SPONSOR: University of Texas Arlington
 ZOOM LINK: <https://SDSU.zoom.us/j/83757027478>

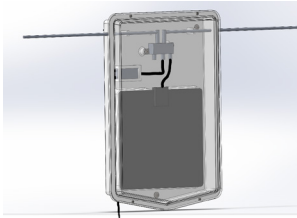


3D Printed Aircraft Competition

The goal of this capstone senior design project is to design and manufacture a 3D printed aircraft to compete in the 5th annual 3D Printed Aircraft Competition (3DPAC) hosted at the University of Texas Arlington in July 2021. The aircraft is allowed five seconds of powered flight, after which, it competes for the longest flight duration under 30 feet of altitude. All lifting surfaces and aircraft components must be 3D printed, except for electronics, the propeller, and some hardware.

FreeTV

MEMBERS: Branden Bizicki, Mark Myren, Vu Nguyen, Patrick Ong
 ADVISORS: Dr. Scott Shaffar, SDSU, Prof. Jeff Wield, SDSU and Kenneth Low - Sandel Avionics
 SPONSOR: Wield Engineering
 ZOOM LINK: <https://SDSU.zoom.us/j/82525186659>



New TV Antenna

FreeTV is entering the 'cord cutters' market in California with a New TV Antenna. FreeTV has designed a low cost, high performance, visually inconspicuous TV antenna for residential users that can reliably receive broadcast signals from local TV stations in UHF and VHF bands. This project features engineering in electrical and mechanical design of components and assembly that is manufacturable in low to high volume production.

Ladders For Lithography

MEMBERS: Saray Basulto, Roland King, Gurisher Rai, Mitchell Schick
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Joe Bendik, ASML
 SPONSOR: ASML
 ZOOM LINK: <https://SDSU.zoom.us/j/81833033215>

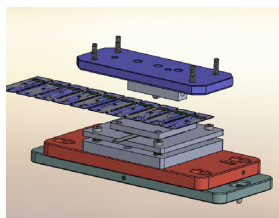


Lithography Chamber Support Platform and Pole

We have designed a raised platform for safe access to all surfaces of an Extreme Ultra Violet Lithography Chamber used by ASML Cymer. In addition to safe access, the platform has an assist pole that provides space for tool storage, laptop placement, and includes a writing surface. The system improves safety and efficiency while working on the chamber, but it is not limited to lithography chambers as it may be utilized for any task requiring improved height access and efficiency.

Like A G6

MEMBERS: Brandon Cerezo, Mitchell Myers, Felipe Sales, David Jerome Valentin
 ADVISORS: Dr. Scott Shaffar, SDSU, Mr. Lenny Barbod and Mr. Jamison Woodward, Dexcom
 SPONSOR: Dexcom
 ZOOM LINK: <https://zoom.us/j/95320764989>

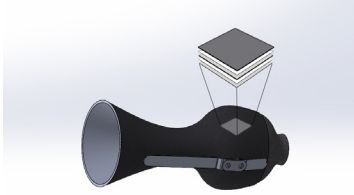


Dexcom Sensor Connection Process Feasibility

The production of sensors is a tricky process that can have a low overall efficiency. There are three key factors when using an Anisotropic Conductive Film to bond sensors and wires; the temperature, time, and pressure. The new design allows for accurate pressure readings with a force sensitive resistor and precise temperature control with a thermal insertion heater. The design will allow the user to determine the best bonding conditions and increase the overall efficiency of the process.

Longevity

MEMBERS: Aaron Eppstein, Daniel Frankul, Patrick Kelly, Thomas Laubender
 ADVISORS: Dr. Scott Shaffar, SDSU and Annemarie Orr, QL+
 SPONSOR: Quality of Life Plus
 ZOOM LINK: <https://SDSU.zoom.us/j/83325466385>



Durable Prosthetic Knee Sleeve

Our challenger is a veteran that lost both of his legs overseas, but that has not stopped his active lifestyle. In order to keep up with this lifestyle, our team has designed, manufactured and tested a more durable prosthetic suspension sleeve to be used with his current vacuum system. By using a silicone-fabric composite and an insertable knee brace, we aim to give a longer lasting and stable suspension sleeve.

The Masketeers

MEMBERS: Justin Bernardo, Kaylin Nguyen, Ayzher Jubilee Ocosa, Damian Orozco
 ADVISOR: Dr. Scott Shaffar, SDSU
 SPONSOR: SDSU Mechanical Engineering
 WEBSITE: <https://aocsona.wixsite.com/esswaf>
 ZOOM LINK: <https://SDSU.zoom.us/j/82372034425>



Educational Seating System with Air Filtration

The challenge is to enable K-12 students (and university level) to be able to return to school with a reduced risk of infection of viruses, specifically COVID-19. Our team designed an affordable system that filters air and any airborne virus near a student's desk or study area without hindering the students' learning experience.

NextGen Prosthetics

MEMBERS: Fernando Bracamontes, Lucía Carballo, Roderick Pacis, Anthony Rooks, Joshua Warden
 ADVISORS: Dr. Scott Shaffar, SDSU and Annemarie Orr, QL+
 SPONSORS: Quality of Life Plus
 ZOOM LINK: <https://SDSU.zoom.us/j/4170944293>



Modular Prosthetic SCUBA Fin

Despite dramatic technological advances in recent decades, there is still work to be done in the prosthetics field, especially in performance-enhancing, activity-oriented equipment for amputees. Our challenger is a wounded veteran with a double leg amputation. Our team was tasked with designing, manufacturing, and testing a modular prosthesis for SCUBA diving. The system's modular aspect is to aid a broad demographic of lower-limb amputees to experience SCUBA diving as naturally and effortlessly as possible.

No Pressure

MEMBERS: Miguel Carlos, Anthony Verduzco-Paz, Roberto Yee, Evan Zuleta
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Charles Tucker, PRA
 SPONSOR: Popular Rotorcraft Association
 ZOOM LINK: <https://sdsu.zoom.us/j/89505485074>

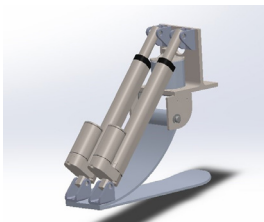


Gyroplane Fuel System - Phase 2

This project encompasses designing, fabricating, and installing a mounting system for a fuel tank redesign to be used on a Gyroplane. This solution will be available as a kit package and components were designed to be modular. The main tank will be mounted via an adhesive-bracket system which will be attached to the keel of the vessel, with vibration dampening pads interfacing between the tank and keel. The auxiliary tanks will be mounted to the mast using a clamp and an adjustable extruded aluminum cradle with a pin bracket fastening system.

Power Rangers

MEMBERS: Andres Bahena, Cole Stewart, Duy Tran, Lindsey Twomey
 ADVISORS: Dr. Scott Shaffar, SDSU and Annemarie Orr, QL+
 SPONSOR: Quality of Life Plus
 ZOOM LINK: <https://SDSU.zoom.us/j/2861790147>

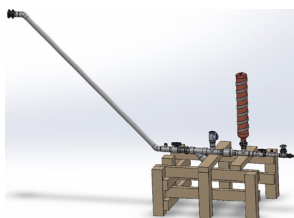


Hiking Powered Prosthetic Foot

Team Power Rangers was tasked with the goal of designing and building a powered prosthetic foot to be used in the outdoors on uneven terrain in order to give the user more assistance and allow them to freely pursue their hobbies. This system will give the passive functionality of an energy return prosthetic foot while also having the capability to be powered and provide the user with additional force for push off on each step.

RamPo

MEMBERS: Grant Jung, Kenzo Maetani, Cash McCormick, Jesse Richard, Max Umland
 ADVISORS: Dr. Asfaw Beyene, SDSU ME and Dr. Scott Shaffar, SDSU ME
 SPONSORS: SDSU Mechanical Engineering
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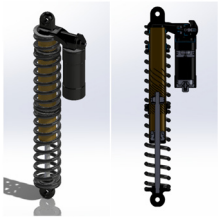


Power Production Using Thermally Infused Ram Pump

The hydraulic ram pump, also known as a "hydam," is a water pump that uses no electricity and converts a source of water from high flow and low head to low flow and high head. Using pressure surges caused by the water hammer effect, these pumps can continuously pump a portion of their incoming water to a much higher elevation. Team RamPo explored the possibilities of using a modified hydram with a thermally infused pressure chamber to generate electricity by running the exit flow through a turbine setup.

Shock and Roll

MEMBERS: Max Drew, James Ho, Venezia Osuna, Brianna Torres
 ADVISORS: Dr. Scott Shaffar, SDSU and Mr. Michael Lester, SDSU
 SPONSORS: SDSU Aztec Baja SAE and Fox Factory
 WEBSITE: <http://www.aztecbajaracing.com/>
 ZOOM LINK: <https://SDSU.zoom.us/j/95719350038>

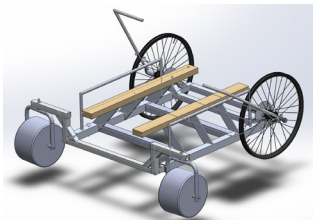


Position Sensitive Shock Absorbers for SDSU Aztec Baja

Aztec Baja SAE would like to improve their current shock absorbers to avoid harsh bottom-outs on tough terrain and to improve overall performance through research, design, and development of position sensitive technology resulting in features to be integrated with the current Fox shock absorbers on the Baja 2020-2021 car. The final design resulted in the addition of a piggyback reservoir and implementation of a grooved body, which acts as a bypass for oil flow.

Smile and Wave, Boys

MEMBERS: Nathaniel Alihan, Andrew Fineman, Colin Knight, Antonio Mejia, Ilias Ybarra
 ADVISORS: Dr. Scott Shaffar, SDSU, Ms. Annemarie Orr, QL+, Ms. Meg Redlin and Mr. Irwin Morse, BAE Systems
 SPONSOR: Quality of Life Plus
 ZOOM LINK: <https://SDSU.zoom.us/j/84448445179>



Waveski Launcher

Our team has been tasked to design, analyze, prototype, and manufacture a waveski launching device that will allow our paraplegic challenger, Mr. Mark Thorton, to launch his waveski into the ocean and to land at the beach while remaining seated in order to make surf sessions easier, less complicated and more efficient.

Sterilight

MEMBERS: Spencer Bravo, Cynthia Frausto, James Reece, Alexander Smith, Gardenia Valenzuela
 ADVISORS: Dr. Kevin Wood, SDSU and Dr. Scott Shaffar, SDSU
 SPONSOR: SDSU Mechanical Engineering
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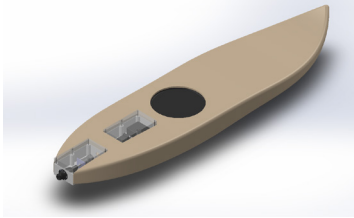


Solar Sterilization System

Access to a cheap, effective, and easily manufacturable system to sterilize medical equipment would help reduce the inequitable occurrence and severity of Health Care Associated Infections (HCAI) in non-standard medical environments, such as those in developing nations and remote military deployments. To remain accessible, it was developed with a minimal number of components that are unavailable or difficult to manufacture in developing nations. Additionally, the system does not require medical consumables to operate.

Surf Limitless

MEMBERS: Antoni Michael Aguilar, Sydney Castillo, Sean Dapiran, Ladan Eslami
 ADVISORS: Dr. Scott Shaffar, SDSU and Annemarie Orr, QL+
 SPONSOR: Quality of Life Plus
 ZOOM LINK: <https://SDSU.zoom.us/j/7274101920>



SDSU Motorized Waveski

A motorized wave ski which gives individuals who are dealing with T4 paraplegia the ability to get through the breaking waves easily without risking their safety and giving them the opportunity to maneuver through the waves and get out to the lineup. Our objective is to design motor and controller components in order to improve balance and driving power of the wave ski, ultimately giving the individual fully independent control to comfortably maneuver through the ocean.

Team Rampage

MEMBERS: Edward Gonzalez-Sainz, Matthew Jensen, Paul Alex Trees, Antonio Vargas
 ADVISOR: Dr. Scott Shaffar, SDSU
 SPONSOR: SDSU Mechanical Engineering
 ZOOM LINK: <https://SDSU.zoom.us/j/88678724664>



Portable Ramps for Curbs

Homeowners with more than one vehicle often don't have a second driveway for their vehicles and this requires the use of portable curb ramps. However, traditional portable curb ramps are impractical, lack versatility, are heavy, and require continuous assembly and disassembly for every use. The objective of this project is to design, fabricate, test, and implement a new portable ramp system with capabilities to support a large RV that solves all the issues previously discussed.

Team SIDD

MEMBERS: David Bell, Sarah Gomez, Iliana Douraghi, Daniel Brandes
 ADVISORS: Dr. Scott Shaffar, SDSU
 SPONSOR: Lenny Barbod, Dexcom, Erik Kuhn, Dexcom
 ZOOM LINK: <https://SDSU.zoom.us/j/9355815635>

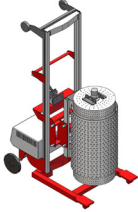


SBS Heat Sealing Process Design

Dexcom develops Continuous Glucose Monitoring (CGM) systems, and the next iteration of their device requires a new packaging system. Our team has designed and produced a Sterile Barrier System (SBS), sealing fixture, and heat sealing recipe that is used to seal a Tyvek lid to the top of the SBS, forming a package.

Thermal Press

MEMBERS: Zachary Fruehe, Jack Gerlach, Charles Patrick Tapecc, Alex Townley
 ADVISORS: Dr. Scott Shaffar, SDSU, Dr. Eugene Olevisky, SDSU, Dr. Elisa Torresani, SDSU and Ms. Maricruz Carrillo, SDSU
 SPONSOR: SDSU Mechanical Engineering
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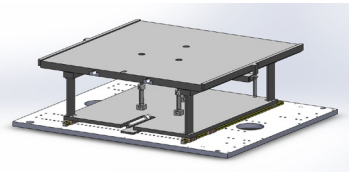


Modification of a Tube Furnace into an Air Atmosphere Hot Press

The SDSU Powder Technology Lab would like to repurpose a vertical tube furnace into a hot press to consolidate materials of high strength. A lift mechanism was modified to lift the furnace into an Instron machine in order to heat the specimens during compression. Tooling was also designed and manufactured to transfer the load from the Instron directly to the specimens. A data acquisition system will acquire temperature during experimentation and record this data using LabVIEW.

Young Smart Designs

MEMBERS: Sean Clare, Martin Cortel, Hunter Hoppis, Phillip Spira
 ADVISORS: Dr. Scott Shaffar - SDSU and Mr. Dave Padgett, Nordson Asymtek
 SPONSOR: Nordson Asymtek
 ZOOM LINK: <https://SDSU.zoom.us/j/8261131493>



Automated tooling design for Printer Circuit Board (PCB) dispense application

Our team was tasked with creating a tooling design that will heat and clamp a warped PCB during the dispensing process. It will be integrated into an existing Nordson dispensing machine, and must be able to move the PCB so that the machine can cover the entire dispensing area.

