DESIGN DAY

SDSU COLLEGE OF ENGINEERING

MONTEZUMA HALL
CONRAD PREBYS AZTEC STUDENT UNION
MAY 2, 2018 | 1:30-3:30PM

Thank you to our Platinum Sponsor

NORTHROP GRUMMAN

Our Spring 2018 Engineering Design Day is dedicated in honor and memory of Dean Morteza "Monte" Mehrabadi, who served as Dean from January 2014 to March 2018.

Dean Monte was very supportive of our SDSU College of Engineering students and truly believed in the positive impact they would have on the world.

WELCOME

Welcome to the College of Engineering's Spring 2018 Design Day at the Conrad Prebys Aztec Student Union, Montezuma Hall. We are proud to have our undergraduate students showcasing their design project work completed during the 2017-18 Academic Year. There are 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: Associated General Contractors (AGC), City of San Diego, City of Santee, Koriist, Northrop Grumman, and Sharp Healthcare. 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.

Enjoy SDSU's Spring 2018 College of Engineering Design Day. Thank you for being a part of this important event.

Eugene Olevsky, Ph.D.
Interim Dean
College of Engineering

1982, F-20 TIGERSHARK

FIRST FLIGHT OF THE F-20 TIGERSHARK, AN ADVANCED VERSION OF THE F-5

SPECIAL THANKS TO OUR PLATINUM SPONSOR

NORTHROP GRUMMAN

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• Dr. Baris Aksanli • Clark Construction Co. • Engineering Outdoors • Group Delta • John Kennedy
• Michael Lester • Dr. Kee Moon • Richard Olimon, Alfa EDM Inc.
• SDSU Department of Aerospace Engineering • SDSU Fabrication Facility • Dr. Sridhar Seshagiri

TABLE OF CONTENTS

ELECTRICAL + COMPUTER ENGINEERING 25

MECHANICAL ENGINEERING 33

MECHANICAL ENGINEERING (CONT...)

NAO ROBOT PROJECT - MOTION PLANNING AND CONTROL ALGORITHMS FOR THE NAO HUMANOID ROBOT
PACMULE - PACMULE
PIN ARRAY MOLD FORMING TOOL (PAMFT) - PIN ARRAY MOLD FORMING TOOL (PAMFT)
PORTABLE 3D SCANNER - PORTABLE 3D SCANNER
PROJECT WISRD - WISRD (WATER IMPACT SHOCK REDUCTION DEVICE)
REAL-TIME IGNITION DETECTION - REAL-TIME IGNITION DETECTION
ROBOTIC PHARMACIST - ROBOTIC PHARMACIST
SDSU FORMULA SAE DRAG REDUCTION SYSTEM - SDSU FORMULA SAE AUTONOMOUS DRAG REDUCTION SYSTEM
SHOCK DYNAMOMETER - SHOCK DYNAMOMETER
SURFBOARD HYDROFOIL - EASYFIT FOIL
TEAM 3 - FISHING LINE RIGGER
TEAM 11 - SMART LOCK
TEAM 18W - RESPIRATORY SYSTEM SIMULATOR, VERSION 2
TEAM 20 - FORMULA 1 ERGONOMIC JIG AND SEAT
TEAM 22: DROWSY DRIVER SENSOR SYSTEM - DROWSY DRIVER SENSOR SYSTEM
TEAM 23 - SURFBOARD RESCUE ATTACHMENT - SURFBOARD RESCUE ATTACHMENT
TEAM NUMBER: 23 - MECHANICAL BEHAVIOR OF THE COMPRESSIVE RESIDUAL STRESS DUE TO SHOT PEENING OF A NICKEL-BASED ALLOY UNDER HIGH CYCLE FATIGUE
WATER BRAKE DYNAMOMETER - WATER BRAKE DYNAMOMETER
WAVE GLIDER FUEL CELL - WAVE GLIDER FUEL CELL MODIFICATION PACKAGE
THE WAY COOLER - THE WAY COOLER
WE “CANE” DO IT! - SMART CANE PROJECT
WIRE EDM ROTARY INDEXER - WIRE EDM ROTARY INDEXER

AERODYNAMIC TACOS

MEMBERS: Daniel Amador, Nadmi Casiano, Aldair Reynoso, Edgard Jimenez, Adrian Rivera, Julio Ortiz
ADVISOR: Greg Marien - Northrop Grumman
SPONSORS: San Diego State University, SDSU Department of Aerospace Engineering

ADVANCE PILOT TRAINER DESIGN AT-30X

The AT-30X is a twin-engine, tandem-seat, next generation advanced jet trainer, and designed to allow student pilots to develop knowledge, skills and practices to fly modern combat aircraft. The AT-30X has a length of 39.5 ft., a height of 12.75 ft., and a wing span of 34.25 ft. The aircraft is designed to meet the rigorous training needs of the U.S. Air Force (USAF). Building upon the proven technology and systems of Kai T-50 Golden Eagle and Northrop T-38 Talon the AT-30X incorporates best in-class U.S. industry technology to provide USAF with the capability it needs today to meet the requirements of tomorrow.

THE AIRBENDERS

MEMBERS: Steven Adena, Cheng You Chow, Chris Clark, Nick Fritzler, Cole Jacobs, Ben While
ADVISOR: Greg Marien - Northrop Grumman

ADVANCED PILOT TRAINER

The Airbenders' T-22 Avatar Advanced Pilot Trainer is a highly versatile aircraft that will greatly enhance the fundamental skills of future pilots, preparing them to adapt to other high performance aircraft in their field of work. The T-22 Avatar is a forward swept, twin engine trainer with a tandem cockpit seating arrangement that includes advanced instrument displays for both the trainer and trainee. The T-22 Avatar was designed with the future in mind, enhancing performance characteristics that are compatible with the future technology in the aerospace industry.

A.I.R D.C

MEMBERS: Reza Heidari, David Jimenez, Clinton Motley, Ivan Ortiz, Cal Seeley (Project Manager), Anthony Talavera
ADVISOR: Greg Marien - Northrop Grumman

A-46 HARPY CLOSE AIR SUPPORT AIRCRAFT

AIR DC designed an experimental close air support aircraft called the A-46 Harpy. We aimed to make the A-46 Harpy the new benchmark in combat aviation with sophisticated design characteristics keeping performance under fire the main priority.

SANDTECH ENTERPRISES

MEMBERS: Angelo Capiral, Mark Halabo, Mark Paulinski, Matthew Villedieu, Timothy Wilkins
ADVISOR: Greg Marien - Northrop Grumman

AE460 DESIGN

Aerospace Engineering aircraft design course. We will be presenting the close air support aircraft that we have designed, as well as some background information, calculations, and design methodology utilized in the design process.

TEAM MAVERICKS

MEMBERS: Tracy Cummings, Alan Gausin, Christopher Keselburg, Marvin Penaranda, Jason Quinten
ADVISOR: Greg Marien - Northrop Grumman

M-10 MAVERICK

The M-10 Maverick is designed to provide flexible, responsive delivery of effective ordinance in close proximity to friendly ground forces. This next generation close air support plane can get to and from the battlefield faster than the USAF's current close air support plane while having the same durability and devastating firepower of the 30mm GAU-8 rotary cannon that made the A-10 so valuable. The latest in avionics, sensors, communications and ordinance allows the M-10 to operate day or night and in adverse weather while reducing the pilot's workload. This allows the lone pilot to focus on the mission.

TEAM ROCKET

MEMBERS: Eliel Chavarin, Kory Delgado, Mark Florek, Aaron Gursel, Tommy Kebschull, Vartouhy Nalian
ADVISOR: Greg Marien - Northrop Grumman

TEAM ROCKET: CLOSE AIR SUPPORT

The culmination of a year's worth of work and thought into a competent and concise design of a close air support aircraft. The project was to be completed as if we were making a design to compete for a military contract. Thus, this design was built around a specific set of requirements given to the group at the beginning of the first semester. The project was graded on how well the design was able to meet each requirement and how well the information is conveyed to the reader. This has served as a valuable learning experience for all members involved.

TEAM SUPERSONIX

MEMBERS: Oliver Bojorquez, Mitchell Kargul, Lindsay Nance, Bao Phan, Rommel Pineda, Isaac Gonzalez Sanabria
ADVISOR: Greg Marien - Northrop Grumman

SUPERSONIC BUSINESS JET: PEREGRINE

Grab a glass of champagne and fly at supersonic speeds with Peregrine! This aircraft is optimized with variable wing geometry and meets the high speed demand of C-level executives and heads of state. Peregrine's cruising speed of Mach 2 (1,534 mph) ensures same day transcontinental travel at business class luxury. This aircraft was designed for the purpose of our AE 460 senior design project that has occupied the last two semesters of our undergraduate careers. We are proud of our accomplishments and we are looking forward to the future of supersonic aircraft!

WITCHCRAFTS

MEMBERS: Lebon Abdi, Justin Arao, Evan Esguerra, Justin Heyer, Kyle Russi, Chance Tiner
ADVISOR: Justin J. Heyer

W/C VULTURE

United States Air Force (USAF) Advanced Pilot Training (APT) Aircraft System component of the APT program. The APT program will replace the T-38C used in the USAF's Specialized Undergraduate Pilot Training (SUPT) advanced phase fighter and bomber (F/B) track, and in the Introduction to Fighter Fundamentals (IFF) course. The APT program will provide student pilots with the foundational flying skills and core competencies required to transition into current generation F/B aircraft. The proposed design shall be land based (U.S. Air Force).

3C ENGINEERING

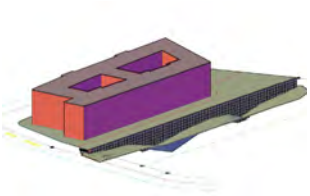
MEMBERS: Saad Arabi, Nathan Bennett, Lindsey Contreras, Ivan Gonzalez, Michel Ortiz, Jose Pimentel, Jesus Rodriguez
ADVISOR: Anselmo Alleva - Sharp HealthCare
SPONSOR: Sharp HealthCare

SHARP HEALTHCARE SANTEE MEDICAL OFFICE BUILDING (MOB)

The project will consist of developing a set of construction plans for a new Sharp Healthcare Medical Office Building (MOB) in the City of Santee located at the southeast corner of Cuyamaca Street and Buena Vista Avenue just north of SR 52. The area will be analyzed in order to develop a site that will accommodate the desired 86,500 square foot, three-story building. A site development drawing and construction plans will be provided with the following reports: traffic analysis, storm water analysis, water and sewer studies, geotechnical study, and a structural analysis.

APEX ENGINEERING GROUP

MEMBERS: Daniel Baguyo, Martin Barajas, Alexis Dial, Terrin Linderman, Jared Ramsey, Sydney Reyes, Dane Walker
ADVISOR: John Prince - Delane Engineering, Inc.



SAN DIEGO STATE UNIVERSITY NEW STUDENT RESIDENCE HALL SITE PREPARATION

San Diego State University requires additional housing for its students and has proposed a six-story building on the corner of 55th St & Remington Road, west of campus. This building will also contain a coffee shop, market, and a community center. The site selected for this building is currently a parking lot. The northern section of the property is almost unusable due to the steep downward slope to a canyon. The site preparation requires a geotechnical analysis, a retaining wall, earthwork calculations and a foundation design. This project will benefit not only the students of SDSU but the surrounding community.

ATEC CONSTRUCTION

MEMBERS: Richard Brill, Craig De La Torre, Robert Galindo, Evan McColl, Victor Urbina
ADVISOR: Jeanine Soriano - Flatiron Construction

GLENDALE AVENUE RECONSTRUCTION

This project is roughly 3 miles long located in an industrial/commercial area of Sparks, NV. The project scope involves the reconstruction of the roadway section which involves roadbed modification, aggregate base, HMA type 2 paving and open grade paving. In addition, there are two major intersections that will have the roadway section reconstructed with Portland cement concrete.

AZTEC ENGINEERING

MEMBERS: Rawan Alroubae, Aya Alsendi, Raia Fattah, Rachel Anne Francisco, Nadeen Germukly, Bashar Jarrar (Project Manager), Sultan Ramadan

SDSU NEW STUDENT RESIDENCE HALL

San Diego State University is proposing a New Student Residence Hall (NSRH) located at the northwest portion of the campus. The project proposed will include three new six-story residence halls connected at the second level and above, a separate coffee shop, and dining hall. We will be responsible for the design and construction of the permanent retaining walls. All analysis of the proposed retaining walls will be based off the report of the geotechnical investigation.

AZTECH ENGINEERING

MEMBERS: Abullah Alzyed, Alyssa Foley, Alexandra Heinritz, Robert Horewitz, Tyler Newman, Eric Pasion, Whitney Stephens
ADVISOR: John Prince - Delane Engineering, Inc.

SDSU NEW RESIDENCE HALL SITE PREPARATION

Designing the retaining wall, foundation, and wall drainage for the site the new residence hall will be placed.

COAST TO COAST ENGINEERING

MEMBERS: Matthew Bruno (Transportation), An Diep (Construction), Carlos Guzman (Site Civil Engineering), David Kline (Project Manager/Water and Wastewater), Alex Preciado (Storm Water), Alex Rangel (Structural), James Wittak (Geotechnical)
ADVISORS: Ramesis Bustamante (PE - City of San Diego), Chris MacPherson (PE - Kleinfelder/Simon Wong Engineering), Dr. Mohammed Bayasi (SDSU), Professor Nensi Lakrori (PE - SDSU), Dr. Julio Valdes (SDSU)
SPONSORS: City of San Diego, Group Delta

NORTH UNIVERSITY FIRE STATION 50

The City of San Diego has requested Design-Build services for the design and construction of a new fire station that will serve the North University Community. The project will be capable of accommodating 10 crew members and the facility will include dorm rooms, kitchen, watch room, ready room, station alerting system, and training classroom. Coast to Coast Engineering has designed a fire station that will keep the crew members alert and ready while giving them the full accommodations to have a tranquil environment during the time they await their next emergency response.

CSB CONSTRUCTION

MEMBERS: Benjamin Capone, Cristian Gutierrez, Carolina Lopez, Sergio Montes, Christian Robles
ADVISORS: Daniel Shirkey (Balfour Beatty), Aaron Magdaleno (The Barrie Company), John Prince (Delane Engineering, Inc.)
SPONSORS: Associated General Contractors, Balfour Beatty, Webcor Builders

UCSF BLOCK 33

The University of California San Francisco proposed the construction of a new medical center in Block 33. The new 340,000 square-foot medical center provides new research and lecture opportunities to the UCSF campus. CSB Construction prepared a Site logistics, Coordination and Traffic Report. In addition, CSB Construction provided a schedule and estimate for alternate building materials. By analyzing structural concrete and structural steel CSB Construction can propose the best building material to the owner, UCSF.

DUCKFOOTS ENGINEERING

MEMBERS: Miles McGinley, Jack Mikesell, Edward Neuman, Alex Sherman, Sara Somers, Lauren Steinberg, Kyler Stevenson

NORTH CITY PURE WATER PIPELINE

The North City Pure Water (NCPW) Pipeline is needed to convey the purified water produced by the new North City Pure Water Facility (NCPWF), located off the 805 in UTC, to Miramar Reservoir. The purified water would be pumped from the NCPWF by a new 30-million-gallon-per-day (mgd) pump station and conveyed via a pipeline that would follow Miramar Road, tunnel under the I-15 Highway, and continue through Scripps Ranch up to Miramar Reservoir. There, the purified water would be dispersed throughout the reservoir via an underwater pipeline that would be constructed on site and installed along the base of the reservoir.

GAIA INTERNATIONAL ENGINEERING

MEMBERS: Ioli Benekou, Hisham Faqeh, Roman Gary, Jihad Kotb, James Ludwick, Quinn Walker
ADVISOR: James Haughey - Michael Baker International

SHARP HEALTHCARE MOB SANTEE

Development of a new Medical Office Building (MOB) in the City of Santee. The proposed MOB structure will include a 60,000 square foot facility with on-site parking.

GOLDEN STATE ENGINEERING

MEMBERS: Ellias Ali, Fahad Alruwali, Dana Hamad, Douaa Redha, Ali Siraj, Mariam Siraj, Joseph Wessling

NORTH UNIVERSITY FIRE STATION 50

This is a design and build engineering service for the community of North University area of San Diego. We are happy to be working with our community.

GRAVITY ENGINEERING INC.

MEMBERS: Hamad Al Marri, Mhd Kenan Alhalabi, Raed Aljasir, Surur Alkaabi, Robert Barragan, Jason Chan, Mohamad Hamcho
ADVISORS: Anselmo Alleva, Project Manager - Sharp HealthCare, James R. Haughey, P.E. - Michael Baker International

SHARP HEALTHCARE SANTEE MEDICAL OFFICE BUILDING (MOB)

The goal of this project is to improve health services for people that live in the City of Santee and they have a need to add facilities to improve coverage for San Diego County to help fulfill their mission. The project also includes development of a new Medical Office Building (MOB).

H2FLOW

MEMBERS: Joseph Bellas, Johnny Deutsch, Sarah Morton, Daniel Valencia, Eric Whatley, Omar Abu Zeineh, Brent Zoucha
ADVISORS: City of San Diego - Pure Water San Diego, Kathy Haynes - HDR

CITY OF SAN DIEGO NORTH CITY PURE WATER PIPELINE

H2Flow was given the task to design the first phase of the City of San Diego Pure Water Pipeline. The pipeline runs for over eight miles from the North City Pure Water Facility to the Miramar Reservoir. This design involved an in depth hydraulic design taking into consideration head, surge, and optimizing diameters. We analyzed the various impacts that the construction of this project would create. The main concern on this project was the crossing of the I-15. Trenchless construction was investigated to circumvent this problem. Many specialties are involved to guarantee this project's success.

LADDER 50

MEMBERS: Tom Dinh, Celeste Estrada, Hannah Garrett, Vicky Lau, Jared Rodriguez, Izary Torres, Dian Zhang
ADVISOR: The City of San Diego - North University Fire Station 50
SPONSOR: The City of San Diego

NORTH UNIVERSITY FIRE STATION 50

Fire stations are a necessity here in San Diego, due to our high risk for fires. We are honored to build one of the most state of the art fire stations in the County. The fire station will house ten firefighters, providing them with a place to eat, sleep, workout, and respond to emergencies efficiently. This two-story fire station is in the heart of La Jolla, capturing the beautiful San Diego landscape as it sits upon a canyon. Some of the more functional aspects that our building will provide include a drive-through garage for the fire trucks and a retaining wall to limit our environmental impact.

NERO ROSSO ENGINEERING GROUP

MEMBERS: Bader Alkandari - CAD Support (Structural & Geotechnical Management), Sultan Alkarbi - GIS Lead (Structural & Geotechnical Management), Zaid Almujalli - CAD Lead (Construction & Geotechnical Management), Ahmed Alotaibi - GIS Support (Structural Management), Raad Alsharif - Design Support (Structural Management), Mohammed Alzayed - Project Manager (Water & Construction Management), Fahad Habib - CAD Support (Water & Geotechnical Management)
ADVISORS: John Prince - Delane Engineering, Inc., Dr. Julio R. Valdes - SDSU, Dr. M. Ziad Bayasi - SDSU
SPONSORS: Clark Construction Company, Group Delta

SAN DIEGO STATE UNIVERSITY NEW STUDENT RESIDENCE HALL SITE PREPARATION

The project is a new residential student building being constructed on the west side of the SDSU campus. The building will have a space of 171,000 square feet, and will house approximately 850 students. The purpose of the project is to prepare the site by providing several alternative designs that will provide stability and price efficiency for the project. The project consists of a Geotechnical Evaluation, Structural Study, Construction Study, and an optional Water Study. In addition, the site will require a retaining wall to be built on the sloping side of the site and a foundation design to make the building last.

PACIFIC DESIGN INCORPORATION

MEMBERS: Jose Castro, Kachun Choi, Danyel Ortega, Rachel Reardon, Katherine Schmidt, Oliver Zavala
ADVISORS: James Haughey - Michael Baker International, Nensi Lakrori - San Diego State University
SPONSORS: City of Santee, Brandon Lacap, Giorgi Naoom, Greg Postelwaite, Shirley Reppert, Kyle Wood - Michael Baker International, Padre Dam Municipal Water District, Allyson Serafico - Rick Engineering, Anselmo Alleva - SHARP Healthcare

SHARP HEALTHCARE SANTEE MEDICAL OFFICE BUILDING

A site development design for a Medical Office Building in Santee on behalf of Sharp Healthcare. The project will include a Traffic Analysis, Geotechnical Report, a Stormwater Management Plan, a Water and Sewer Study, Structural Analysis and Cost Estimates.

PERFORMANCE DESIGN

MEMBERS: Michelle Filanc, T.J. Grace, Connor Shellito, Ryan Sipple
ADVISOR: John Prince - Delane Engineering, Inc.

LUHRS MARRIOTT HOTEL

The Luhrs Marriott Hotel is a hotel development in downtown Phoenix, Arizona. The hotel is a dual flagged Marriott Hotel valued at roughly $50,000,000. The 240,000 SF development consists of 20 floors of hotel space, encompassing 320 guest rooms. The basement level houses maintenance facilities, electrical rooms, and a large vault housing equipment for the Arizona Public Service Electrical Company. The hotel provides Courtyard Rooms on Levels 5 through 9 and Residence Inn Suites on levels 10 through 19. The hotel also provides areas and amenities for dining, lounge, pool, exercise, and equipment.

POSEIDON ENGINEERING AND CONSTRUCTION

MEMBERS: Adra Alkuree, Baraa Almnaseer, Ahmad Alnami, Alex Garabedian, Nathan Harrison, Sally Youna
ADVISOR: James R. Haughey, P.E. - Michael Baker International

SAN.REUSE

SAN.Reuse is a stormwater reuse project for the San Diego International Airport (SDIA) and is part of its Airport Development Plan which identifies improvements that will enable the airport to meet demand through 2035. The project entails stormwater harvesting and treatment as an alternative non-potable water supply for SDIA.

PRECONSTRUCTION TEAM

MEMBERS: Elaina Baldwin, Sepas Johari, Scott Salvatore
ADVISOR: Jim Lewis - Swinerton

ALA MOANA TOWER

For this project, we will be acting as the preconstruction department of a General Contractor in the Honolulu area. Ala Moana Tower is a 41-story multi-use high rise in downtown Honolulu, Hawaii. The first 10 floors will be hotel space with one floor being a mixed use amenity space. After this, there will be 30 floors of apartments. In addition to the work that we have already completed for this project, we will be evaluating the effects of adding two floors to the building, alternative site logistics, LEED design, and relocation of the project site to another city.

RED ENGINEERING

MEMBERS: Abdul Ababtain, Nour Alsammar, Haya Al-Sumaiei, Alejandro Corral, Lynn Hassoun, Ali Jasim, Laura Panduro
ADVISORS: City of San Diego Pure Water, Tamara Parsons - SDSU, Thomas Zink - SDSU
SPONSOR: City of San Diego Pure Water

NORTH CITY PURE WATER PIPELINE

The North City Water Pipeline Project is focused on the construction and installation of a pipeline to convey water from the North City Pure Water facility in UTC to the Miramar Reservoir. It is oriented towards improving San Diego's water reuse practices in order to reduce dependency on foreign imports. RED Engineering's approach includes the application of civil, construction, environmental, hydraulic and geotechnical concepts while complying to local and state regulations and standards.

SALIENT ENGINEERING

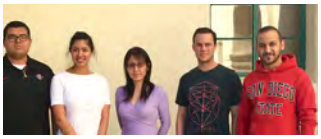
MEMBERS: Abraham Fernandez, Laith Hawatmeh, Kevin Hoffert, Patrick Luster, Jake Marshall, Tyler McFadden, Shan Sandhu (PM)
ADVISOR: Anselmo Alleva - Sharp Healthcare

SHARP - MEDICAL OFFICE BUILDING

Located at the corner of Cuyamaca Street and Buena Vista Avenue in Santee, California, a brand new Sharp - Medical Office Building has been proposed to be built. Salient Engineering has been tasked with creating a design that not only utilizes the lot efficiently but will be able to meet the needs of Sharp as well as the public. Our team of highly skilled and innovative individuals work hard to fulfill the needs of all our clients to produce a finished product that not only the owner will be proud of but Salient Engineering as well.

SAN DIEGO PREMIER BUILDERS

MEMBERS: Ali Al-Emadi, Alex Cant, Adolfo Contreras, Xiaochen Li, Lallie Valadez
ADVISOR: Jim Haughey - Michael Baker International

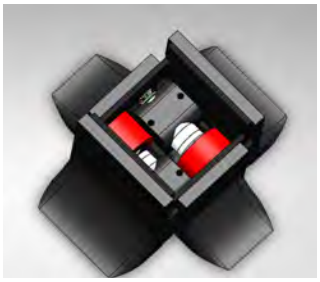


NORTH UNIVERSITY FIRE STATION 50

SDPB plans to assist the City of San Diego in their efforts to improve Fire-Rescue response capabilities by designing the optimal site configuration to facilitate the most effective development of the proposed San Diego Fire Station 50. This will involve the investigation of existing site conditions, formation of a site layout, design of on and off-site improvements, planning for construction and presentation of project recommendations in order to promote the foremost usage of the property for its intended purposes.

THE AZTECHS

MEMBERS: Faisal Aljaber, Mohammed Alsehali, Adrian Fernandez, Patrick Gerardo, Michelle Hernandez, Jaclyn Penano
ADVISOR: John Kennedy - San Diego State Univeristy
SPONSOR: John Kennedy - San Diego State Univeristy
WEBSITE: http://aztechs.sdsu.edu



AUTONOMOUS SUMO ROBOT COMPETITOR

Our project involves the design and implementation of a Mini Sumo Robot which adheres to the Unified Sumo Robot Rules. The robot we have constructed has two wheels that are placed in an offset position. Because of this, we are able to use larger and more powerful motors than our opponents given the size constraints of the competition. Our design includes the utilization of Time-of-Flight sensors to accurately detect the opponent's position within the ring, in addition the use of reflectance sensors to be able to detect when our sumo robot is at the edge of the ring, allowing it to react appropriately.

BEAM TEAM

MEMBERS: Stefan Dangoy, Ryan Grant, Jacob Harbour, Leyu Lin, Matthew Paterniti
ADVISOR: Ken Arnold - SDSU

DIGITAL AUDIO BEAMFORMER

For in-home, communication, and entertainment purposes, our Digital Audio Beamformer will aim to have a target hear an audio signal that only they can hear. An array of speakers, with each having a unique phase offset, will have their signal be constructive at one point in space while destructive everywhere else. HDL in an FPGA will compute the necessary phase offset for each speaker in the array before sending those signals to the speakers to be played. Other components such as a numerically controlled oscillator, delta sigma converters, and filters will assist in transforming a DC wave into an AC wave.

CIRCUIT BREAKERS

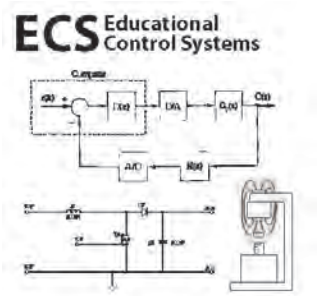
MEMBERS: Janpaul Alamani, Blake Caudle, Juan Gutierrez, Gerard Laconsay, Jeff Presar, Jefferey Teixeira
ADVISOR: John Kennedy - Senior Design Lab
SPONSOR: John Kennedy - Senior Design Lab

MINI SUMO ROBOT

The goal of this project was to create a mini robot to compete in a mini sumo robot competition. Our design relies on wheel encoders which are used to determine exactly how fast our robot is moving. This allows us to develop more complex algorithms that rely on us having more precise control over our robots' maneuvers. With this amount of precision we are able to find our opponent faster and position appropriately to push them out of the ring.

EDUCATIONAL CONTROL SYSTEMS (ECS)

MEMBERS: Abdulrahman Almanie, Mashael Alraqaib, Robert Paul, Danny Tran
ADVISOR: Dr. Sridhar Seshagiri - San Diego State University
SPONSOR: Dr. Sridhar Seshagiri - San Diego State University
WEBSITE: http://ecs.sdsu.edu



DESIGN OF LOW-COST EDUCATIONAL CONTROLS EXPERIMENTS

In teaching undergraduate automatic controls, the laboratory experience is an important and irreplaceable component. Historically, good platforms for a controls laboratory have been expensive, because the equipment has typically been very specialized for educational purposes. We develop low-cost experiments that are built around the Arduino platform, that is supported by Matlab/Simulink and LabView, and thus provide a great deal of flexibility in control design. The hardware plants include magnetic levitation, and power electronic converters, allowing students to design and implement control systems for challenging benchmark problems.

FALCON

MEMBERS: Mohammad Alshugair, Royce Aquino, Victor Huerta, Layth Jabbar, Hoang Linh Nguyen, Abdulaziz Tunisi, Gregory Woods
ADVISOR: John Kennedy - San Diego State University
SPONSOR: John Kennedy - San Diego State University
WEBSITE: http://teamfalcon.sdsu.edu/home

TEAM FALCON

MINI-SUMO AUTONOMOUS ROBOT

Our robot will weigh no more than 500g in mass, dimensions 10 cm x 10 cm with any height and the budget limited to $500. Our ideology for the robot was for it to be agile in maneuvering in the ring not only to evade an opponent, but to also outsmart and push the opponent out. We set three different modes for battle: search and evade, stealth attack, and the Falcon PUNCH! Allowing our robot the flexibility of these three modes will enable it to adapt to any situation and/or opponent that may present itself. The design is focused on two aspects: maximum wheel base power and fast recognition of opponents.

FALL NO FUN

MEMBERS: Sonia Fischer, Raffy Guiao
ADVISOR: Dr. Mahasweta Sarkar - SDSU

INDOOR GEOLOCATION AND FALL DETECTION IN AN ASSISTED LIVING FACILITY

This project builds a smart phone application that locates and updates resident information on a location facility map on handheld devices.

GMSB

MEMBERS: Mustafa Alhashimy, Nasser Alobaid, Jeremiah Fa'atiliga, Naseeb Khaznadar, Hemed Khodadadfar, Vahid Naghipour
ADVISOR: Ken Arnold - SDSU
WEBSITE: http://aztecguard.sdsu.edu

AZTEC GUARD

We are working on passive RFID tags and sensors. We will be making our own tags system that cannot interfere with each others frequency and bring up the security when someone takes them out from the door which will be secured by loop or sensors around it. In that case the alarm will sound and notify people nearby. And since the tags do not need any power source, we also can use them inside expensive devices too, which will not be visible for the eye to remove.

GRABGUARD

MEMBERS: Sean Barry, Marlin Benjamin, Edward Ha, Brandie Low, Naomi Navarro, Natalie Ortiz
ADVISOR: Ken Arnold - SDSU
SPONSOR: Michael Lester - SDSU
WEBSITE: http://grabguard.sdsu.edu

ANTI-THEFT SYSTEM

A node and gateway that utilize LoRa (Long Range) technology to track the location of large cost items in SDSU's College of Engineering Machine Shop. The node is attached to the item and senses WiFi SSIDs and BSSIDs and then communicates that information to the gateway receiver located near the Machine Shop. If the gateway receives an SSID that is not SDSU's, it will alert local authorities that the item has left the Machine Shop.

OPENPH

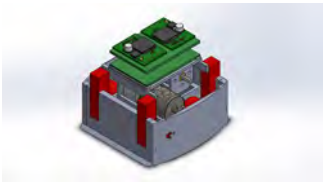
MEMBERS: Michael Baker, Emanouil Gelyana, Kevin Lew, Anna Gabriela Reed, Anthony Rice, Alice Sokolova
ADVISOR: Dr. Baris Aksanli - SDSU
SPONSOR: Dr. Baris Aksanli - SDSU

OPEN SOURCE RASPBERRY PI POTHOLE DETECTION

The project is to create a real-time camera system that can be mounted on (and eventually installed into) vehicles to detect potholes on the road. This information will be gathered in a crowd-sourcing manner and sent to a database available for the city as a tool to know where potholes are located around the area.

PRJKT AFK

MEMBERS: Nayeli Corral, Yaneli Corral, Ricardo Lazo, William Mendoza, Hayden Nguyen, Brendan Zuniga
ADVISOR: John Kennedy - SDSU
WEBSITE: http://prjctafk.sdsu.edu/

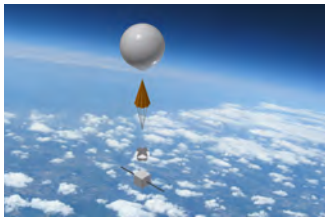


FRANK THE TANK

We are one of the seven teams that participated in the ECE Senior Capstone Design's Mini-Sumo Autonomous Robot Competition, which was held on Monday, April 30th, 2018. Most professional mini sumo teams create two-wheeled, high speed and very maneuverable robots. Frank the Tank's design is much slower, but with significantly high amounts of torque and traction using four wheels. Through this design philosophy, we are able to both stand out among the competition and overpower other robots while still meeting the eligibility criteria for formal mini sumo class competitions.

RADIO

MEMBERS: Joey Casabar, Max Delgadillo, Eric Johnson, Brett Pennoyer, Joshua Stein, Joshua Tran, Lindsay White
ADVISOR: Dr. Sridhar Seshagiri - SDSU
SPONSOR: IEEE SDSU
WEBSITE: http://www.radio.sdsu.edu



RADIO (REMOTE ATMOSPHERIC DETECTION & IMAGING OPERATIONS)

The goal of this project is to launch a weather balloon that will carry a payload, and create a ground station to track the balloon and receive data. The ground station will process the data from the balloon. Telemetry will be relayed via APRS on amateur radio frequencies, and another transmitter will be the central communication point for all of additional sensors and data transmission. The ground station will automatically orient the receive antenna towards the payload antenna for optimal data reception. All antennas will be designed and built by the group.

RETURN 0;

MEMBERS: Miguel Castro, Ernesto Celis-Encinas, Martin Engelsgjerd, Jesus Flores, Daniel Foster, Andres Gomez, Vahe Ohanian, Edgar Ramos, Brian Vo
ADVISOR: Ken Arnold - SDSU
WEBSITE: http://return0.sdsu.edu

SEARCH AND RESCUE: ROBOT COMPETITION - TEAM B

As defined by the competition rules, the objective of the competition is to design a search and rescue prototype vehicle that can both navigate via remote control and autonomously. The remote-controlled navigation is to be achieved via a live camera feed and alternatively the autonomous function is to be achieved using sensors to navigate obstacles. The final goal is for the vehicle to be able to navigate around several types of terrains in order to reach a set target.

ROGUE TWO

MEMBERS: Brian Buu, Daniel Deaton, Rain Gopeng, Ryan Morris, Adam Olivera, Buse Ozsuca, Nicholas Payne, Madeleine Rasche, Jose Tomimatzu, Alvaro Valera-Rivera
ADVISOR: Ken Arnold - SDSU
SPONSOR: Self-funded
WEBSITE: http://roguetwo.sdsu.edu

AUTONOMOUS ROVER

This rover has manual and autonomous capabilities making it great for search and rescue, and other such things where eyes are needed, but connections are not always reliable. The rover will come home on its own when triggered to return. The first person view camera allows a user to drive the car from a remote location.

SD POWER BACKUP

MEMBERS: Anas Aldujaili, Samer Aldujaili, Sultan Almuzaiel, Mohammad Behbehani, Robert Cory-Sills, Javier Guevara, Amel Najeeb, Sebastian Salem, Devon Yousif
ADVISOR: Ken Arnold - San Diego State University
WEBSITE: https://SDPower.sdsu.edu

SD SOLAR POWER BACKUP

This solar charged battery backup system will allow 5 VDC and 120 VAC compatible appliances to plug in via USB ports or a standard wall outlet, respectively. The system itself is completely off grid and can work solely off the optimized solar panels and Lithium Ion battery system. The intent is to supply power at times when an electrical grid is de-energized or perhaps simply not available. The design is intended to be modular and portable to allow easy access to power in any given area.

SECURERF

MEMBERS: Jordan Damian, Michael Swin, Vy Tat, Sonia Tran, Melos Woldai, Redal Yaqo
ADVISOR: Michael Lester - SDSU
SPONSORS: Michael Lester - SDSU Department of Mechanical Engineering, Fabrication Facility at SDSU
WEBSITE: http://securerf.sdsu.edu

ANTI-THEFT SYSTEM

Expensive equipment has been stolen from the machine shop, and with no current security system in place, future thefts may occur. SecureRF utilizes RFID technology and a wireless camera security system to alert campus police in the event that a valuable is stolen.

Our team is collaborating with GMSB and GrabGuard, focusing on the integration aspect of the design.

S.H.A.D.O.W. SQUAD

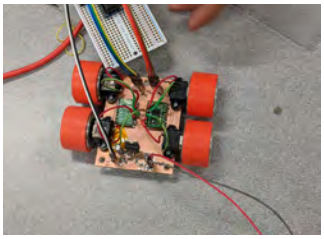
MEMBERS: Tahgreed Alzahrani, Kevin Archangel, Marcel Brucker, Venus Buccat, Ohmeko Campo, John Ervin, Allison Langley, Nikesh Patel
ADVISOR: Professor Ken Arnold, SDSU
WEBSITE: http://shadow.sdsu.edu

SHADOW OF SAM

Shadow of SAM is a mobile hacking platform designed for enterprise network security countermeasures. Shadow of SAM collects wireless information through wifi signals and will alert companies of any malicious activity and vulnerabilities. Shadow of SAM offers a wireless foot-printing and reconnaissance tool with capabilities of scanning and enumeration.

SQUARE UP

MEMBERS: Vincen Chan, Ivan Chavez, Andrew Cintora, Cody Friszell, Nhi Lam, Janrel Leano
ADVISOR: John Kennedy - SDSU

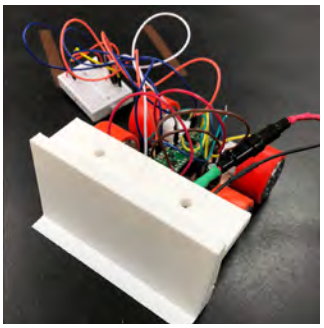


MINI SUMO AUTONOMOUS ROBOT COMPETITION

We will be one of the teams that will be competing in the ECE Senior Capstone Design competition that will consist of our robot and another.

TEAM A.B.I.G.A.I.L.

MEMBERS: Kathleen Callejo, Faye Castillejos, Victor Franco, Arvin Lleva, Yared Mekonnen, Frederick Riehl, Sirak Yohannes
ADVISOR: John Kennedy - San Diego State University
WEBSITE: http://Abigail.sdsu.edu/



MINI SUMO ROBOT

Our team is participating in a Robot Sumo competition amongst other senior design teams where two robots attempt to push one another out of the ring (Dohyo). The robots that are used in our competition are called 'mini-sumo', a smaller and lighter version of the Standard National Robots used in the official Robot Sumo games. The requirements for the mini-sumo class stands up to any height, up to 500g in mass and 10cm by 10cm in size. These robots are not allowed weapons like BattleBots, but instead a ramp that can scoop and push the other opponents autonomously.

YOKO-ZOOM-BOT

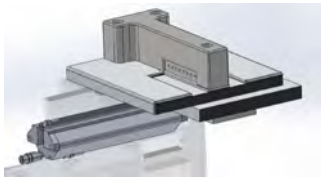
MEMBERS: Dylan Caballero, Kevyn Cabling, Brandon Castro, Tymofiy Dovgan, Dennis Le, Juan Mederos
ADVISOR: John Kennedy- San Diego State University
SPONSOR: John Kennedy- San Diego State University
WEBSITE: http://volta.sdsu.edu/~yokozoom/

YOKO-ZOOM-BOT

Yoko-Zoom-Bot is an autonomous robot competing in a mini-sumo robot competition. As such, Yoko-Zoom-Bot will weigh 500 grams or less, have no offensive weapons or jamming devices, include an IR start trigger, and have a length and width of 10 cm or less. It will also be configured to operate on a circular playing surface, or dohyo, that is 77 cm in diameter with a border line width of 2.5 cm. This project will be implemented by mechanical designs and fabrication, but mainly by electrical and computer engineering prowess.

AUTOMATED GOLF CLUB POSITIONING SYSTEM

MEMBERS: Kolby Buller, Ryan Gates, Samir Qafiti, Jack Twomey
ADVISOR: Chad Arch - Acushnet Company
SPONSOR: Titleist



AUTOMATED GOLF CLUB POSITIONING SYSTEM

The automated golf club positioning system project is a revamped design for Titleist which emphasizes simplicity and effectiveness. This system is a sub-assembly of a top level machining process which cuts the shaft of golf clubs to specified lengths for standard and custom orders. The new system moves the golf club into three positions for left and right handed clubs. The simple design will have easy tear down capabilities to keep pace in a manufacturing environment along with position variability to constrain the position based off new golf club designs and specifications.

AUTONOMOUS DRONE SURVEILLANCE SYSTEM

MEMBERS: Alex Aleshin, Matt Maddox, Adam Michalak, Brandon Pounds
ADVISOR: Chad Trytten - Koriist
SPONSOR: Koriist US Systems

AUTONOMOUS DRONE SURVEILLANCE SYSTEM

Autonomous drone surveillance system that responds autonomously to motion sensors in remote areas.

AZTEC BAJA SAE FRONT SUSPENSION

MEMBERS: Ryan Delaney, Brandon Fitzpatrick, Garrett Gauthier, Alex Valenzuela
ADVISORS: Michael Lester, SDSU Machine Shop
SPONSOR: Aztec Baja SAE

AZTEC BAJA SAE FRONT SUSPENSION

Rebuilt Front Suspension for Aztec Baja car to be more durable and lightweight.

AZTEC ELECTRIC RACING HUB MOTOR TEAM

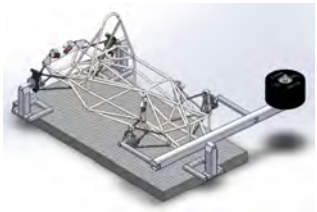
MEMBERS: Steven Arroyave, Nicholas Mallory, Octavio Reyes, Gregory Sawvelle
ADVISOR: Dr. Kee Moon - San Diego State University
SPONSOR: Aztec Electric Racing
WEBSITE: http://aztecelectricracing.com/

HUB-MOTORS

Our project consists of an Alta motor attached to each upright of a Formula Electric Race Car. Each motor powers a planetary gear system which in turn powers the wheel, giving it the necessary RPM and torque required to reach 72 mph and a 1.43s 0-60mph.

AZTEC RACING

MEMBERS: Mariana Angel, Dan Jennings, Adam Kuebler, Nicholas Whitaker
ADVISOR: Michael Lester - San Diego State University
SPONSOR: Aztec Racing FSAE
WEBSITE: http://fsaeaztecracing.wixsite.com/aztec-racing



CHASSIS TORSIONAL TESTING FIXTURE

Aztec Racing is building a modular torsional testing fixture that can be used on Formula SAE, Formula SAE Electric, and SAE Baja chassis. This fixture will allow student race teams to test the torsional rigidity of their designs. The final fixture will have automated features such as a linear actuator to control load input and a data acquisition system to help with data recording and interpretation. Future teams will be left with an instruction manual to help in the setup and operation of this testing fixture.

CAPPER

MEMBERS: Dusty Fisk, Aaron Rollins, Koray Kayhan, Jethro Miguel
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Ayhan Kayhan - Papilion

CAPPER

The purpose of our project is to create a fully automated assembly line robot that can PLACE and PRE-TIGHTEN TRIGGER CAPS onto soap bottles. This project is sponsored by Papilion, a cosmetic manufacturing company located in Istanbul, Turkey. Currently, up to 4 workers place and screw on trigger caps by hand. The CAPPER machine will allow these workers to focus on more important tasks saving the company money and increasing efficiency! For our senior project we have created a proof of concept prototype that the company will later re-build with industrial grade parts.

CASTER BLASTER

MEMBERS: Aidan Garland, Jeramy Huerto, Luis Rivera, Tristan Swanberg
ADVISOR: Dr. Kee Moon - San Diego State University

CASTER BLASTER

Two-wheeled electric inline transportation vehicle. A cross between a bicycle and a skateboard.

CHEF CUBED

MEMBERS: Anthony Guiao, Tyler Hadzicki, Nicholas Thompson, Josh Torres
ADVISORS: Tyler Hadzicki - Hadz Co., Dr. Kee Moon - San Diego State University
SPONSOR: Tyler Hadzicki - Hadz Co.

CHEF CUBED

Chef Cubed allows beginner chefs to record and share recipes, translating them into customized directions that can be adapted for other users. It also interprets cooking times and acts as a Bluetooth enabled timing device that provides the user with real time cooking instructions. It features calibration technology to account for differences in kitchen appliances and cooking equipment.

CNC BANDSAW

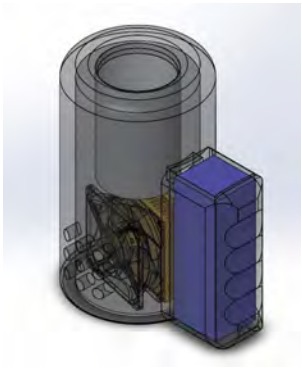
MEMBERS: Brandon Gomez, Michael Larmon, Stephen Mercsak
ADVISOR: Kee Moon - San Diego State University

CNC BANDSAW

We are designing an add-on for a horizontal bandsaw that will allow the user to manually feed material into the bandsaw, but control the length and angle of the cut electronically.

COOL IT

MEMBERS: Joseph Bojorquez, Samuel Espinoza, Briana Johnson, Chris Jones
ADVISOR: Dr. Kee Moon, San Diego State University
SPONSOR: Self-funded



PORTABLE DRINK COOLER

This project is a portable drink cooler designed specifically for cans. It is designed to have a 3d printed outer shell with an aluminum insert in order to hold the can. The cans are cooled by a peltier chip attached to a heat sink in order to create a heat flux within the device. This chip-heat sink system will be cooled using forced convection created by a CPU fan. These two components are wired in parallel to a W1209 temperature control switch, which is in series with a 14.8 V battery.

DR. AKBARI HAMED RESEARCH PROJECT

MEMBERS: Justin Albert, Christopher Deutschman, Zach Middaugh, Bradley Tucker
ADVISOR: Dr. Kaveh Akbari Hamed - SDSU Department of Mechanical Engineering

ESTIMATION AND LOGGING OF BIPEDAL MOTION STATE VARIABLES

Implementation of Inertial Measurement Unit sensors and pressure sensors to obtain the global angular position of the torso, femur, tibia, and feet of bipedal motion, and display of the current position using Python data interpretation and Matlab vector calculations and display. This data can be used in the future to design robotic systems to follow the motion described by this data.

EMG/EOG CONTROLLED UAV

MEMBERS: Ryan Hodges, Gabriel Mattix, Wyatt Owens, Dillon Thinnes
ADVISOR: Dr. Kee Moon, SDSU Mechanical Engineering Department
SPONSOR: Dr. Kee Moon, SDSU Mechanical Engineering Department

EMG/EOG CONTROLLED UAV

This project incorporates ocular movements (EOG) and eye blinks (EMG) to control a small UAV. The purpose of this project is to act as an educational tool for children in grades K-12. The intent is for it to inspire young people to pursue college degrees in STEM related fields.

EUROPA LANDER

MEMBERS: Michael Acosta, Tanner Fanjoy, Jonathan Reiland, Taylor Webster
ADVISORS: Cecily Sunday - NASA Jet Propulsion Laboratory, Dr. Khaled Morsi - SDSU

EUROPA LANDER DRILL DRIVE

Jupiter's Europa moon has been identified as a candidate for life, and a NASA mission is scheduled to drill through the icy surface. NASA has requisitioned a drill drive in order to optimize drill designs. Given stringent requirements on mobility, interface, package size, and torque/RPM, the team has spent the past months designing a drive to meet JPL's specifications. The final design includes planetary gear arrangements followed by a bevel gear, and employs two interchangeable drill bits on a rotating carousel for optimum movement. Parallel motors ensure the necessary torque and RPM to effectively engage the ice.

GROUP 10

MEMBERS: Kendall Broton, Ally Ferrell, Brianna Manns, Eric Ohler
ADVISOR: Kee Moon - SDSU

SURFING HYDROFOIL

Designing a low-speed hydrofoil for a surfboard that allows for solo-person operation.

GROUP 14

MEMBERS: Ben Adams, Nazar Alabid, Saif Alsafar, Michael Parra
ADVISOR: John Moran - Northrop Grumman
SPONSORS: Lance Eischeid, John Moran - Northrop Grumman

RADAR OFF-SITE SENSOR TEST STAND

Design and manufacture a mobile Radar subsystem test configuration that can be operated at an offsite test range where the Radar can radiate and the system can process real targets. The test fixture will hold the following:
1- Leonardo Osprey 30 Radar w/ 2 AESA panels
2- FLIR BriteStar-II EO/IR Camera
3-Shine Micro AIS Receiver and Antenna
4- GPS Antenna
The Sensor Test Stand shall hold the two AESA panels and the FLIR BriteStar-II EO/IR Camera in a position that resembles their actual position in an MQ-8C Unmanned Aerial Vehicle.

GROUP 16: AUTOMATIC TIRE INFLATOR

MEMBERS: James Cahill, Ziggy Geitheim, Alphonso Hababba
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Student Sponsored

AUTOMATIC TIRE INFLATION DEVICE

A system that can attach to a car tire that monitors air pressure in the tire and uses compressed air to keep the tire inflated in the case of a loss in pressure.

GROUP 22

MEMBERS: Angel Gallego, Francisco Guerrero, Emmanuel Hernandez, Emanuel Mixquitl
ADVISOR: Hamid Nourollahi - SDSU

EDUCATIONAL TRIBOMETER

Educational device that will serve as a laboratory for students, enhancing their knowledge in fluid dynamics and mechanical components.

K-WIRELESS PERCUTANEOUS PEDICLE SCREW SYSTEM

MEMBERS: Sarah Chin, Chris Kirley, Nicolas Lang , Garrett Mikels
ADVISORS: Mitch Eberle, David Loomis - NuVasive Inc.
SPONSORS: Mitch Eberle, Rob German, David Loomis - NuVasive Inc.
WEBSITE: https://www.nuvasive.com/

K-WIRELESS PERCUTANEOUS PEDICLE SCREW SYSTEM

In the spine industry, the standard of using a Kirschner wire or k-wire to place a pedicle screw in the spine helps achieve safe patient outcomes, however it significantly increases operating time. Our goal is to minimize the steps to place a minimally invasive pedicle screw, removing the k-wire device and optimizing the surgical time. All of this must be done with the patient in mind, ensuring safety and the best surgical outcome.

LOAD BEARING EXOSKELETON

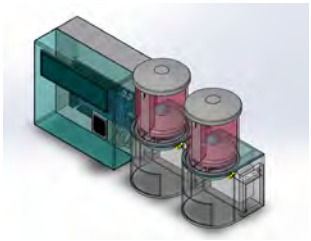
MEMBERS: Alexandra Arambula, Marvin Meza, Nathaniel Porter, Max Verkhovtsev
ADVISOR: Dr. Kee S. Moon - SDSU

LOAD BEARING EXOSKELETON

The passive exoskeleton concept is intended to function as a mobile support structure that can alleviate up to 50 lbs of carried weight from its user. As the exoskeleton moves with its user, it has a mobility advantage over other mechanical devices, such as carts or dollies, that would typically be used otherwise. There are several primary benefits of such a device, including its ability to traverse over difficult terrain such as stairs and construction sites, as well as aiding the user in confined spaces, and offering hands free convenience and skeletal strain-relief during item transport.

ME 490B GROUP 21

MEMBERS: Joshua Fornasdoro, Engelberto Macias, Jesus Rodriguez, Kathy Ruiz
ADVISOR: Dr. Kee Moon, San Diego State University
SPONSOR: Self Sponsored



SMART PILL DISPENSER

The Smart Pill Dispenser aims to provide cheap, safe, easy access to medication, along with intuitive prescription scheduling to fit an individual's needs.

MINI BAJA CVT

MEMBERS: Azael Castro, Juan Gonzalez, Kevin Sargent, Tiffany Wuence
ADVISOR: Michael Lester, SDSU Fabrication Shop
SPONSORS: Aztec Baja SAE, Performance Plastics, Inc.

COOL AIR INTAKE FOR MINI BAJA CVT

In order to avoid belt slippage and inefficiency for the Mini Baja car, our team is designing a cool air intake made out of carbon fiber that is also equipped with oil cooled lines to bring down the high temperature of the CVT during competition in extreme climate.

MOTORIZED SHELVES

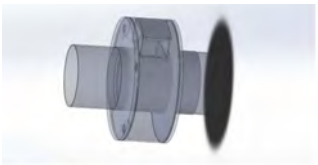
MEMBERS: Humoud Alasfour, Ghaleb Almutairi, Almoather Alnahwi, Salah Alwasmi
ADVISOR: Dr. Kee Moon, San Diego State University

MOTORIZED SHELVES

In order to improve what's in the market, the team came up with the project that is called "motorized shelf" in which a person won't take any risk while getting anything from a shelf and maintain as little effort as possible. The team believes that this project would help in preventing cases related to trying to reach high places; therefore, falling injuries will be reduced and safety will be ensured.

MY AC: RESIDENTIAL VAV SYSTEM

MEMBERS: Kia Bullock, Russell Kellogg, Edward Nazaradeh

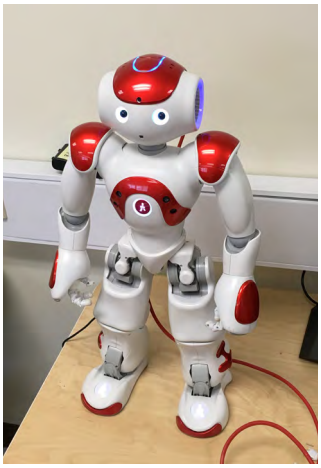


MY AC: RESIDENTIAL VAV SYSTEM

A residential variable air value system that will be installed in the home's air duct that will regulate which room within the household will receive the conditioned air. The system will be operated by an application installed on the homeowner's smart phone or tablet.

NAO ROBOT PROJECT

MEMBERS: Jeff Hopkins, Jack House, Alex Mieczkowski, Adam Sorensen
ADVISOR: Dr. Kaveh Akbari Hamed - SDSU



MOTION PLANNING AND CONTROL ALGORITHMS FOR THE NAO HUMANOID ROBOT

This project involves the development of algorithms for motion planning, object avoidance, and stability for a humanoid robot. Motion planning applies the gradient descent method for calculating artificial potential fields in order to discover efficient paths in the presence of obstacles. The algorithm is applied on the NAO H25 humanoid robot platform, with focus on navigating the robot's arm through space.

PACMULE

MEMBERS: Johnson Diep, Kevin Mullenix, Elijah Stein, Michael Wolfe
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Self Sponsored

PACMULE

A smart energy harvesting phone case that harnesses unintentional motion on an electromagnetic platform.

PIN ARRAY MOLD FORMING TOOL (PAMFT)

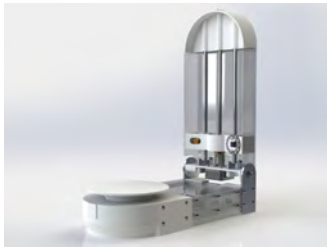
MEMBERS: Douglas Brantley, Rachel Goddard, Ana Heris, Alex Tapia
ADVISOR: Dr. Kee Moon - San Diego State University

PIN ARRAY MOLD FORMING TOOL (PAMFT)

The Pin Array Mold Forming Tool (PAMFT) is a subtractive thermal cutting machine designed to cut features out of foam faster than a CNC 3-axis mill, offering an option for low-cost rapid fabrication of one or two part molds and dies. Currently, plastics, laminates, composites, and sheet metal parts are formed over a high strength mold which is cost and time intensive to machine from stock metal. The PAMFT tool consists of an array of superheated vertically controllable pins to thermally cut wide sections of a foam stock.

PORTABLE 3D SCANNER

MEMBERS: Randy Custodio, Andrew Liu, Hoan Pham, Alex Stevens
ADVISOR: Dr. Kee S. Moon - San Diego State University
SPONSOR: San Diego State University



PORTABLE 3D SCANNER

A folding 3D scanner that utilizes laser triangulation technology and open-source software.

PROJECT WISRD

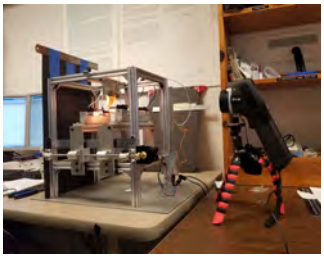
MEMBERS: Edgar Pahua Arango, Joshua Johnson, Harman Kaloty, Trenten McGrann
ADVISOR: Dr. Kee Moon - San Diego State University

WISRD (WATER IMPACT SHOCK REDUCTION DEVICE)

WISRD will reduce the impact of a falling body into the water by generating bubbles that will rise to the surface, thus lowering the effective density of water. The device will be fully submerged underwater and will have its own air supply regulation that will provide air to the tubes. WISRD contains four major subsystems: Air Supply/ Regulation, Bubble Dispersion, Portability, and Durability to provide a high quality product that will fit consumer needs.

REAL-TIME IGNITION DETECTION

MEMBERS: David Bahena, Cameron Castellano, Robert Clay, Cesar Garcia
ADVISOR: Dr. Subrata Bhattacharjee - SDSU Department of Mechanical Engineering
SPONSOR: San Diego State University, SoFIE



REAL-TIME IGNITION DETECTION

Create a system capable of determining when ignition occurs in solid fuels in real-time. Additionally, changes to the structure and control system will be made to increase the experimental repeatability of ignition tests.

ROBOTIC PHARMACIST

MEMBERS: Erasmo Canongo, Saul Flores, Alfredo Gonzalez, Tito Seda
ADVISOR: Dr. Kee Moon - SDSU
SPONSORS: Javier Escobedo, Victor Escobedo - D&K Engineering

ROBOTIC PHARMACIST

Introduce a new basic prototype development of an automated dispensing unit for pharmaceutical uses which include:
- Utilized as a kiosk
- Used as a medical device that helps pharmacist refill and fill prescriptions

SDSU FORMULA SAE DRAG REDUCTION SYSTEM

MEMBERS: Lobna Allam, Sean Jarnot, Jesus Moreno, Walter Schneider
ADVISOR: Michael Lester - San Diego State University
SPONSOR: Aztec Racing (SDSU Formula SAE IC)

SDSU FORMULA SAE AUTONOMOUS DRAG REDUCTION SYSTEM

The purpose of the drag reduction system (DRS) is to rotate the airfoils on the rear wing package to maximize the SDSU Formula SAE car's performance. The airfoils will have the ability to shift the angle of attack to minimize any drag force that may impede the velocity of the vehicle when activated. This will be implemented autonomously outside of corners.

SHOCK DYNAMOMETER

MEMBERS: Carlos Correa, Brandon Lyons, Brent Neely, Elvin Obellos
ADVISOR: Michael Lester - San Diego State University
SPONSORS: Aztec Baja SAE - SDSU, Competitive Metals, Fox Racing, San Diego State University, SolidWorks

SHOCK DYNAMOMETER

A shock dynamometer (dyno) is a piece of equipment used to display how the damping force of a shock changes with shaft velocity. A shock is fixed at one end, and attached to a vertical shaft on its opposing end. The vertical shaft is connected to a motor in such a way that as the motor turns, the shaft displaces vertically for a set distance. A load cell at the shock's fixed end is used to sense the amount of load on the shock and this is translated to a computer program. A motor runs through a set list of velocities, plotting how much force is being recorded at each velocity. A Force vs. Velocity curve is created.

SURFBOARD HYDROFOIL

MEMBERS: Abdulrahman Almshaweh, Travis McCurdy, Marco Sanchez-Lisboa, Anthony Viggiano
ADVISORS: Dr. Kee Moon - SDSU Department of Mechanical Engineering, Michael Lester - SDSU Fabrication Facility
SPONSORS: Nick Dodder - Aku Shaper, Fabrizio Siboldi - Artista Entertainment, Guillermo Sanchez - Pacific Forest, Dr. Asfaw Beyene - SDSU Department of Mechanical Engineering, Joaquin Hernandez - Tortuga Tropic

EASYFIT FOIL

Our project consisted of designing and manufacturing a hydrofoil, as well as the surfboard to go with it. It is a custom made short board with a regular five fin setup, as well as an embedded hydrofoil attachment system.

TEAM 3

MEMBERS: Joseph Cashman, Feras Ghulam, David Nino, Regina Perez
SPONSOR: Student Sponsored - SDSU

FISHING LINE RIGGER

The goal of Team 3 was to design, fabricate, and test a device which aids in threading and tying fishing hooks. This device is intended to aid those with physical disabilities which would make such activities difficult.

TEAM 11

MEMBERS: Khaled Almesbah, Hamad Alomran, Fawaz Alrushaid, Ahmad Bumaryoom
ADVISOR: Dr. Kee S. Moon - SDSU

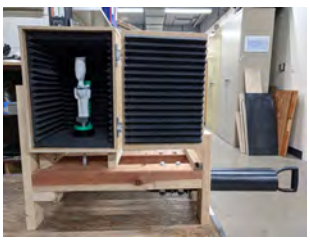
SMART LOCK

Smart Lock is a device that enables its user to lock and unlock the door by an application on a smartphone; furthermore, it replaces the need of keys. Smart Lock will be directly installed onto a door lock and move the lock shaft on command. This project aims to solve the following problems:
- The inconvenience of carrying keys.
- The capability to lock and unlock doors manually.
- The ability to keep doors unlocked in case of a fire emergency.

What makes this Smart Lock unique is the addition of the following features:
- The fingerprint detection system.
- Unique installation method.
- Temperature Sensor.

TEAM 18W

MEMBERS: Ahmed Alanazi, Robert Cruz, Xavier Guerrero, Steve Nguyen, Stephanie Anne Raya
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Dr. Kee Moon - SDSU



RESPIRATORY SYSTEM SIMULATOR, VERSION 2

This project is a continuation of a project that was started by a senior design team last year. The purpose of the project was to build an apparatus that will be used in research; conducted by Aerospace Engineering graduate student Mohamed Abassi. The research is to observe the acoustics that are conducted through a trachea. The main focus of the goal is providing a set volume of air to the trachea as well as providing a noise reduction box to minimize noise.

TEAM 20

MEMBERS: Sulaiman Alsafran, Khaled Alseddiki, Khaled Altoum
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Aztec Electric Racing

FORMULA 1 ERGONOMIC JIG AND SEAT

Building ergonomic jig to take full measurements of the driver position in order to build the Formula 1 seat.

TEAM 22: DROWSY DRIVER SENSOR SYSTEM

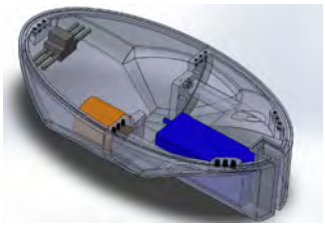
MEMBERS: Nour Alamer, Ahmad Aldashti, Ameena Alkhameri, Aishah Alsilahi
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Dr. Kee Moon - SDSU

DROWSY DRIVER SENSOR SYSTEM

Designing a case for a Sensor System that senses when a driver has become drowsy. The design needs to be comfortable, easy-to-wear, lightweight, stable, and waterproof.

TEAM 23 - SURFBOARD RESCUE ATTACHMENT

MEMBERS: Ryan Anderson, Jennifer Boman, Lauren Enos, Simran Nebhnani
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Mike Critchfield - Critchfield Mechanical INC



SURFBOARD RESCUE ATTACHMENT

Our project is building a Surfboard Rescue Attachment -- a detachable device to strap onto your surfboard to help lifeguards and other safety personnel reach those in need more quickly. The attachment is powered by brushless motors, lithium batteries, and other components in order to maximize the speed of a lifeguard paddling to a victim.

TEAM NUMBER: 23

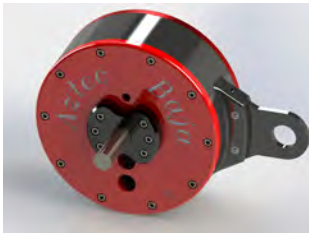
MEMBERS: Sultan Alsuwayhil, Fahad Altoub, Andy Bautista, Luis Rojas
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Michael Kirtley, Edward Mcquillan - Safran Power Units

MECHANICAL BEHAVIOR OF THE COMPRESSIVE RESIDUAL STRESS DUE TO SHOT PEENING OF A NICKEL-BASED ALLOY UNDER HIGH CYCLE FATIGUE

This project studies the behavior of the effects of shot peening on Nickel based alloys, particularly DA718, under high cycle fatigue. The point at which the operating stress negates the positive effects of shot peening is the cycle where the compressive residual stress begins to diminish. Through numerical method and validation through tests, this cycle can be determined at certain stress levels.

WATER BRAKE DYNAMOMETER

MEMBERS: Baylin Bridges, Tyler Brinkman, Branden Elam, Helena Rodriguez Fernandez
ADVISOR: Michael Lester - San Diego State University
SPONSOR: Aztec Baja SAE

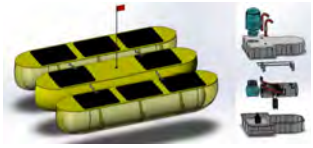


WATER BRAKE DYNAMOMETER

The Water Brake Dynamometer design project uses the Viscous coupling principle to measure the power output of a rotating shaft. The objective of this project is to implement a Water Brake Dynamometer for the Aztec Mini Baja-SAE team, enabling other systems to make data driven design innovations. The dynamometer will be essential in measuring the efficiency of the Aztec Baja-SAE drivetrain, as well as the torque in the axles under full load. In addition, it will be needed to calculate theoretical forces in the transaxle, and to tune the Continuously Variable Transmission.

WAVE GLIDER FUEL CELL

MEMBERS: Sahand Borujerdi, Jesus Daniel Cerda, John Gewarges
ADVISORS: Matt Handfelt, David Hoyt, Chris Maceyko, Dan Redman - Northrop Grumman
SPONSOR: Northrop Grumman



WAVE GLIDER FUEL CELL MODIFICATION PACKAGE

Identify a concept for, and perform design and analysis of, a Wave Glider fuel cell modification package that would allow for a 3-month continuous operation in winter above the arctic circle. This would include a power analysis for optimizing fuel cell operation with the existing platform, environmental fuel cell enclosure design, and fuel tank design.

THE WAY COOLER

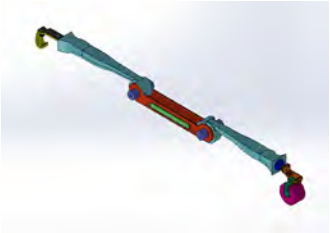
MEMBERS: Adam Lehman, Emmanuel Montes, Gregory Peterson, Austin Rebik
ADVISOR: Engineered Outdoors, Dr. Kee Moon - SDSU
SPONSOR: Engineered Outdoors

THE WAY COOLER

A light-weight, modular device, that converts any insulated space into a low cost, energy efficient, precision controlled, mobile refrigeration system.

WE "CANE" DO IT!

MEMBERS: Ahmed AlRafae, Alex Lee, Daniel "Xuanting" Li
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Kelvin Crosby - Living Beyond the Label



SMART CANE PROJECT

An autonomous robotics system to guide people who are blind. Currently, people who are blind use guide dogs to navigate through urban areas. Many who are blind are unfortunately under the poverty line or simply cannot afford a guide dog without financially compromising themselves. The guide cane is designed to be an advanced, yet affordable device for many of the members of the blind community. Because of the scope of the cane system, sensitive and expensive electronics will be used. As a mechanical team of the guide cane project, we are tasked to design a cane that can collapse automatically without harming electronics.

WIRE EDM ROTARY INDEXER

MEMBERS: Jaifar Al Aamri, Rashed Al Araimi, Alexis Olimon
ADVISOR: Dr. Kee Moon - SDSU
SPONSOR: Ricardo Olimon - Alfa EDM Inc

WIRE EDM ROTARY INDEXER

A submersible rotary indexer that can accurately position a workpiece.