CSUN® | COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

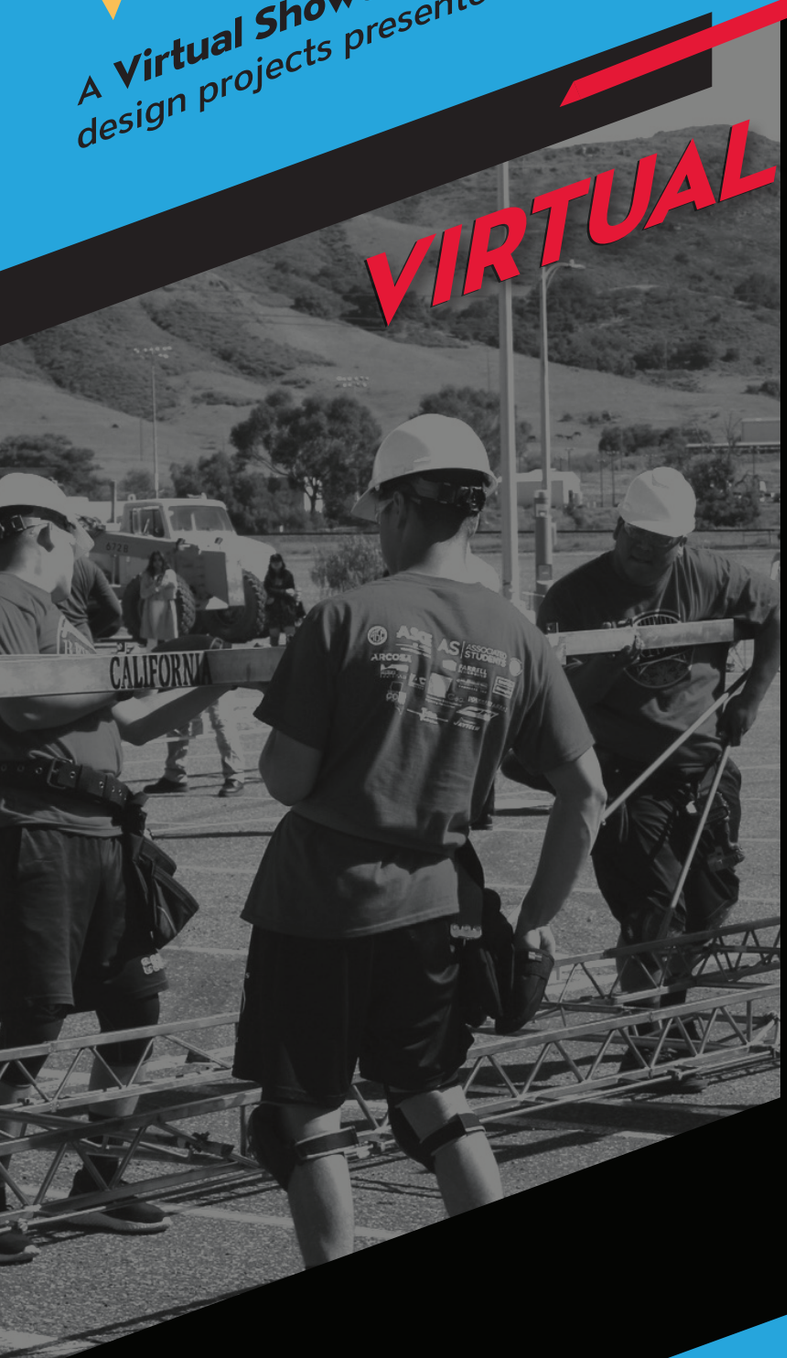
AUTODESK® SDPS 2020

Senior Design Project Showcase

V-SDPS

A **Virtual Showcase** of student senior design projects presented on May 1, 2020

VIRTUAL SHOWCASE



FEATURING

Oral presentations of student senior design projects from the College's nine undergraduate programs to include:

- Civil Engineering
- Construction Management
- Electrical Engineering
- Computer Engineering
- Computer Science
- Computer Information Technology
- Mechanical Engineering
- Manufacturing Systems Engineering
- Engineering Management

- ***See inside for project abstracts and links to presentations.***

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AUTODESK SDPS 2020

Senior Design Project Showcase

VIRTUAL SHOWCASE

HELD ON FRIDAY, MAY 1, 2020

Virtual Oral Presentations (via Zoom Webinar)

SESSION A

Civil Engineering & Construction Mgmt | Mechanical Engineering

- **9:00 AM** **Dean's Opening Remarks**
- **9:05 AM** Research on The Design and Certification of a Residential Steel Building
- **9:30 AM** Analysis and Design of an Earthquake-Resilient Building in San Diego
- **10:00 AM** What to do with all this Water?
- **10:30 AM** Concrete Canoe
- **11:00 AM** Steel Bridge
- **11:30 AM** Cumulus Tower

12:00 - 12:30 PM Lunch Break

- **12:30 PM** Formula SAE Electric Vehicle
- **1:00 PM** Formula SAE Internal Combustion
- **1:30 PM** SERL Senior Design
- **2:00 PM** Smart Morphing Wing
- **2:30 PM** Smart Prosthetics
- **3:00 PM** Aero Design Project: El Toro Volador
- **3:30 PM** Intelligent Ground Vehicle
- **3:50 PM** **Dean's Closing Remarks**

SESSION B

Manufacturing Systems Engineering & Management | Electrical & Computer Engineering | Computer Science

- **9:15 AM** B.F.F. Modular Robot
- **9:45 AM** Paint-Boy 3000
- **10:15 AM** Window Cleaning Robot [Withdrew - was not available to present]
- **10:45 AM** Smart Antenna for Small Satellites
- **11:15 AM** UAV DRONE
- **11:45 AM** ARCS Project for Airborne Vehicle and Agnostic Sensor Integration Platform

12:05 - 12:45 PM Lunch Break

- **12:45 PM** Autonomous Vehicle Tennis Ball Collector
- **1:15 PM** OFF-TOP
- **1:45 PM** Schedule Simulator
- **2:15 PM** UDorm
- **2:45 PM** Botfleet

SESSION A

Projects are listed in order of presentation on event day.

Click on the project name to go to the project abstract page. Video links are provided ▶.

SESSION B

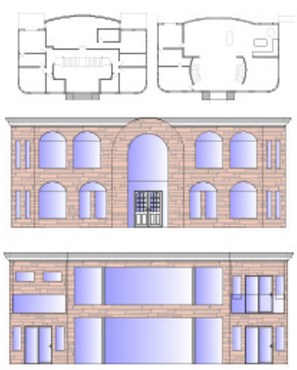
Projects are listed in order of presentation on event day.

Click on the project name to go to the project abstract page. Video links are provided ▶.

BACK TO SCHEDULE

PROJECT ABSTRACTS

CIVIL ENGINEERING & CONSTRUCTION MANAGEMENT

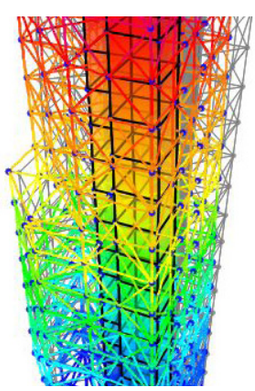


Faculty Advisors: *Dr. David Boyajian, Dr. Tadeh Zirakian*

Team: *Abeer Almutairi (Captain), Abdullah Alsanie, Eric Bonilla, Wilmer Cuc, Ramy Naguib, Frank Zablocki*

Research on the Design and Certification of a Residential Steel Building

This paper discusses the design of a 2-story residential, moment-resisting structure using steel by Civil Engineering senior design students. Part of the effort was to include LEED features to the final product and to provide a cost analysis of both versions of the structure to determine the viability of converting an existing building to be LEED certified. It is hoped that the resulting analysis will help the readership better understand the costs associated with becoming a sustainable household, as well as to determine trends in the cost associated with becoming LEED certified. It can also serve as an educational tool to aid other engineers on the flexibility of such a project when considering the diverse background of the students and the culmination of ideas to make such a project flourish.



Faculty Advisors: *Dr. Tzong Ying Hao, Dr. Sami Maalouf*

Team: *Debbie Altamirano, Jennifer De Avila (Captain), Michael Flores, Paul Ginter, Julio Lopez, Peter Messiha, Alina Phung, Gerardo Reyes, Alex Rivera, Luisangel Valenzuela*

Analysis and Design of an Earthquake-Resilient Building in San Diego

Large investments have been made for the construction of a new high rise building in San Diego. This project reports on a new iconic building to be constructed in the heart of downtown San Diego. Downtown San Diego lies right on top of the Rose Canyon Fault zone. It's quite possible for San Diego to be struck by an earthquake that is similar to the July 2019 7.1 magnitude Ridgecrest, CA.

Our team proposed a building that is architecturally beautiful and structurally resilient. It will also promote environmentally friendly and innovative technology.

Faculty Advisor: *Dr. Sami Maalouf*

Team: *Pearce Ferriter, Carl Humphrey (Captain)*

What to do with all this Water?

Inspired by the existing flooding that occurs during rain events, this project intends to address increasing demand for water in a developing area of campus. The design will address the '15% reduction in water consumption' goal of CSUN's Institute for Sustainability: as stated in the CSUN Sustainability Plan, 2013-2023. The presentation will show a new independent water network that utilizes excess storm water. Actuated by the increasing demand for water on campus due to the growth of the university—facility expansion and the population increase of staff, faculty and students—this research will yield a pragmatic solution that forwards the move to action towards a green campus. Through this proposal, excess storm water that was initially a nuisance on Darby and Etiwanda Avenue, can now be utilized in a meaningful way with infrastructure sensitive to a green CSUN.

BACK TO SCHEDULE

CIVIL ENGINEERING & CONSTRUCTION MANAGEMENT continued...

Faculty Advisors: *Dr. Rais Ahmad, Dr. Sami Maalouf*

Team: *Joseph Cambron, Matthew Cristi (Captain), Emily Garcia, Paul Ginter, Armen Kazarians, Christian Martinez, Jasmine Molina, Andy Sanchez*

Concrete Canoe

The project involves fabricating a 19' canoe composed of concrete. From the design of the hull to the fabrication of the canoe, a group of civil engineers worked together in order to complete the project. The different areas of the project include mix design, hull design, construction, and aesthetics. Each area contains a senior lead and junior lead. Through research and past projects, the concrete canoe team had the ability to revolutionize the project through the design and fabrication. Not only were we able to fabricate a canoe of concrete, but we were able to develop the characteristics of leadership, teamwork, and the ability to overcome adversity within each individual. We hope that the information provided from this year's project will serve as a baseline for the upcoming years of concrete canoe.

Faculty Advisor: *Dr. Rais Ahmad*

Team: *Adam Banihamed, Sian Bashkiroff, Alejandro Bernardo, Ivan De La Cruz, Angelica Estrada, Megan Godinez, Houmam Haddad, Alexis Hernandez, Christopher Patron (Captain), Victor Ramirez, Omar Saenz, Loiusa Songco, Ben Zilber*

Steel Bridge

Steel Bridge is an annual competition currently held by the American Institute of Steel Construction (AISC). Universities from across the country participate every year in their respective regions to which a different scenario is presented for students to apply the knowledge gained through their academic careers in order to satisfy the required design specifications. Competitors are ranked on the basis of structural efficiency and construction economy.

This competition is entirely student-based which means students will design, fabricate, and construct the bridge themselves. The purpose of Steel Bridge is for student members to develop skills in leadership and teamwork while also providing a fun way to interact with peers.

Faculty Advisor: *Dr. Anwar Alroomi*

Team: *Pahola Chavez, Brian Lopez, Omar Romero, Emiliano Saldana (Captain), Carlos Segura*

Cumulus Tower

The following oral presentation and model presentation pertains to the Cumulus Tower Project, located in La Cienega and Jefferson in the city of Los Angeles, California. The project address is 3321 South La Cienega Blvd, Los Angeles CA, 90016. The following project will be a mixed-use development consisting of commercial tenant space and mezzanine and 22 floors of residential units. We will be presenting our bid proposal for this project. Which includes our detailed estimate and schedule as well as presentation of our scaled model of the Cumulus Tower to our audience.

MECHANICAL ENGINEERING (ME)

Faculty Advisor: *Dr. Stewart Prince*

Team: *Monica Andrade, Daniel Ayala, Alejandro Bernardo, Sean Crouse, Andrew Delgadillo, Marco Estrada, James Gill, Thad House, James Jose, Roy Ko, Timothy Lee, Jorge Leon, Theo Licas, Jake Lyon, Andrew Magallanes, Javier Magana, Yervant Manoukian, Daniel Mejia, Ivan Mendoza, Daine Mendoza, Eddie Monjaraz, Jose Morales, Jordan Mumper, Gaston Olvera, Anibal Olvera, Andrew Ossa, Yoselin Ramos, Morgan Ryan (Captain), Joshua Santana, Jerome Sempio, Joshua Shepherd, Samuel Smith, Joshua Tapia, Jeff Tolentino, Luke Veronese, Christian Wheeler*

Formula SAE Electric Vehicle

Formula SAE is an international design competition that CSUN has been competing in since the early 90s. Well versed in the internal combustion class, CSUN seeks to compete in the electric vehicle class. Last year featured a first iteration electric vehicle converted from an old combustion car. This year, the team went with a vehicle architecture purpose built around the electric drivetrain.

Faculty Advisor: *Dr. Stewart Prince*

Team: *Nick Alvarado, Joseph Barton, Andrew Delgadillo, Hirantha DeMel, Adreas Demetriou, Armineh Ghookasian, Anthony Hart, Kevin Hernandez, Andrew Janco, Huan Lieu, Javiar Magana, Derek Mayfield, Fern Mojica, Carlos Mota, Kevin Munoz, Huzaifa Omer, Sagar Pradhan, Eduardo Reyes, Juan Rivera, Ruben Rodriquez, Gene Rodriquez, Sergio Saab Gonzolez, Sam Sabzanov, Darian Vaden, Vanessa Valencia, Eric Valentin, Alex Van Pelt, Blanca Villafuerte, Jacob Vorzimer (Captain), Christian Wheeler*

Formula SAE Internal Combustion

Formula SAE Internal Combustion is dedicated to the design and manufacturing of a Formula SAE compliant race car, aimed to maximize the total points scored at competition, while remaining within the resources available at CSUN. This racecar is built to a target market of non-professional weekend autocross racers. The team must compete against universities around the world at the FSAE competition.

Faculty Advisor: *Prof. Amiel Hartman*

Team: *Juan Argote, Johnny Bolanos, Raffi Charkhedian, Byrone Dela Paz, Corey Dobbs, Brandon Fricke, Renzo Ginocchio, Jason Graziano, Jose Guzman, Juan Hernandez, Adrian Hernandez, Seth Klotzle (Captain), Maverick Morgan, John Morgan, Navid Najera, Eric Nguyen, Hyunjin Oh, Francisco Oropeza, Kiet Phan, Branden Pulicari, Donnie Rambo, Alex Rodriguez, Andres Silva, Michael VanSuchtelen, Alfredo Viera*

SERL Senior Design

The Systems Engineering Research Laboratory (SERL) senior design project brings together students from mechanical engineering in collaboration with electrical and computer engineering to participate in concept design, manufacturing and programing of a search and rescue system with robotics to assist first responders in saving lives. The project research considers topics such as drone autonomy and interaction between human and machine. The system design consists of a drone fleet operated by a mobile ground control station (MGCS) in the field. The drone fleet includes the compact autonomous exploratory search and rescue rover (CAESARR) for indoor hazard detection, mapping and human detection, as well as unmanned ground and aerial vehicles for outdoor operation.

Faculty Advisor: *Dr. Peter Bishay*

Team: *Jake Alger, Artur Balyan, Cristobal Barajas, Marcelo Carlos, Leonardo Flores, Richard Flores, Edgar Guzman, Rommel Herrera, Antony Khalil, Kebron Kibret, Tommy MacLennan (Captain), Justin Perez-Norwood, Rafael Reyes, Adam Schlup (Captain), Bianca Talebian, Gregory Thatcher, Christian Torres, Mathan Vasu*

Smart Morphing Wing

Smart Morphing Wing is a research-based Senior Design Project whose objective is to design, simulate, build and test low-drag innovative seamless morphing unmanned aerial vehicle (UAV) utilizing 3D printing, smart materials and composite structures. The 2019-20 cohort designed, built and tested a fully-morphing UAV with twist-morphing wings and camber-morphing horizontal and vertical stabilizers. This experimental UAV, named "Matamorph-2" or XM-2, does not need traditional flight control surfaces, such as ailerons, elevators or rudders to take-off, land, maneuver, or adjust the flight path. XM-2 features a hybrid fuselage design, wings with composite spars, Balsa wood ribs, carbon-fiber laminated composite wing-root and wing-tip sections, foam twisting section covered by flexible skin, and servomotors in a gearbox for twist-morphing. The camber-morphing tail stabilizers feature 3D printed flexible active ribs with embedded servomotors, airfoil-shaped foam sections, and flexible skin. In-house computer applications have been created to guide the design process. Extensive computational fluid dynamic (CFD) analyses have been performed to optimize the new design. The team competes at the AIAA regional student conference, and present their research work at CSUNposium.

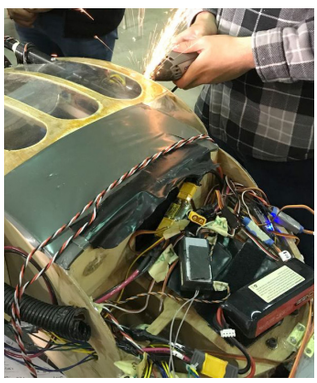
MECHANICAL ENGINEERING continued...

Faculty Advisor: *Dr. Peter Bishay*

Team: *Elvis Agustin, Phillip An-Perez, Samuel Ayala, Thea Behimino, Sbetlana Carmona Marin, Charles Castro, Carmen Garcia, Jennifer Jimenez, Mahamadou Kaba-Camara, Abraham Lozano Lozano, Shakeel Madhav, Miriam Maravillo, Joel Martin, Tanner Mastrud, Daniel Sanchez, Ricky Sanchez, Christina Seeholzer (Captain), Matthew Vazquez*

Smart Prosthetics

Smart Prosthetics is a research-based senior design project that focuses on designing, analyzing, building, and testing advanced light-weight innovative prosthetic devices. The 2019-20 cohort introduced new ideas and innovations by developing two new prosthetic arm designs. The "MYOwn" arm features new finger design with "butterfly clips", fingertip pressure sensors, haptic feedback system, and pattern recognition system. The "Hall-and-Oates" arm features a novel actuation system that utilizes only one servomotor to actuate all fingers to grip objects of any shape. The arm also has linkage mechanism to transfer the motion to the fingers. Both designs are controlled using myoelectric actuators. Extensive analysis and testing have been done to optimize the actuation and controllability of the designs. The work is presented annually at CSUN's annual research and creative works symposium (CSUNposium).



Faculty Advisor: *Dr. Shadi Mahjoob*

Team: *Alberto Aguilera, Heriberto Aguilera, Lance Alix, Edwin Delgado, Ben Victor Fernandez, Daniel Guerrero, Maximilian Hollander, Daniel Huynh (Captain), Kyle Marion, Francisco Pacheco, Steven Paqueo, Gonzalo Ramirez, Reymundo Rodriquez, Jonathon Rud, Cristian Salazar, Anasheh Tooroosian, Elizabeth Zanabria*

El Toro Volador

The primary goal for CSUN Aeronautics is to safely deliver the maximum amount of colonists onto the surface of Mars while maximizing the total days of habitability, based on the Final Flight Score. This aircraft sacrifices a conventional structure for a payload oriented design driven by the Advanced Class mission objectives. Aerodynamics, structures, avionics, systems and integration, and manufacturing teams work together to design an aircraft capable of meeting and exceeding mission expectations. Design constraints laid out by SAE Aero Design East Advanced Class include a maximum wingspan of 11 feet, 750 watt power limiter and a maximum take-off weight of 55 pounds. Final flight score is achieved by systematically releasing first the payload, consisting of water bottles and nerf howlers, followed by the autonomous gliders at specific altitudes onto a 50 foot radius target zone. This hands on experience emphasizes the importance of blending together teamwork, knowledge, and dedication.

Faculty Advisor: *Dr. Vidya Nandikolla*

Team: *Robert Aguilar, Nicholas Barbieri (VP), Rebecca Blackwell, Aaron Chamness, Andrew Cole (President), Hrithik Das, Nicholas Deatherage, Everett Fuller-Bunyon, Javier Godina, Maikel Heness, Celeste Iniguez, David Kaya, James Lozano, Andrew Munoz, Christopher Nunez, Raj Patel, Hector Perez, Kevin Saginian, Robert Solis, Vinh Thai, Mohammed Zamon*

Intelligent Ground Vehicle

IGV (Intelligent Ground Vehicle) is an engineering senior design project where students from different disciplines work together to build a robot. The goal of this project is to design and implement an autonomous robot capable of competing in the Intelligent Ground Vehicle Competition. The competition outlines the following technical requirements: lane detection and holding, obstacle avoidance, path planning, and GPS navigation. To achieve these tasks the students, design a platform with a computer and integrated with sensors such as a LIDAR, Camera, Compass, IMU, and GPS. The cognition and software integration teams develop a software architecture to reliably navigate the course lanes, obstacles, localize the robot, and guide it through each waypoint.

BACK TO SCHEDULE

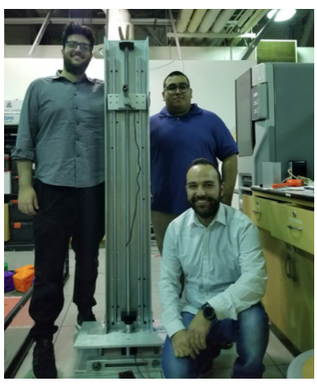
MANUFACTURING SYSTEMS ENGINEERING & MANAGEMENT (MSEM)

Faculty Advisor: *Dr. Khashayar Behdinan*

Team: *Jean Paul Collazo, Raymond Manning Jr., Millo Martinez, Carla Pichardo (Captain), Luis Rosales, Tam Tran*

B.F.F. Modular Robot

This year's CSUN Manufacturing Systems Engineering team is designing, manufacturing, and assembling a collapsible automated robot cart which will aid humans to carry personal and industrial items up to 40 pounds in weight. There is a folding platform shelf that extends for smaller items so the user doesn't always have to bend down. The system will be able to move forward and backwards, left to right and will use a Pixi camera, ultrasonic, and infrared sensors in order to keep a safe distance and avoid collision with the user and its surroundings.



Faculty Advisor: *Dr. Khashayar Behdinan*

Team: *Mathew Garcia, Viken Minaskanian (Captain), Alen Sarokhanian Ghalesari, Shawn Vartanian*

Paint-Boy 3000

Autonomous wall painting robot meant to assist manual labor in painting rooms by completely painting a vertical 66" patch of surface with a 9" standard paint roller. The robot's aim is to speed up the process through the opportunity of large surface painting. allowing more time for manual laborers to paint corners, and prepare other decorative features. The robot is constructed primarily of 6061-T6 aluminum, and utilizes ultrasonic and load sensors to actuate and create a closed-loop with the primary actions of the robot, being: 1. the wheels for side-to-side mobility and maintaining proper distance from the wall and other obstacles, 2. the linear actuator to keep the paint roller in constant contact with the painting surface, with proper force being applied to maintain even coverage of paint.

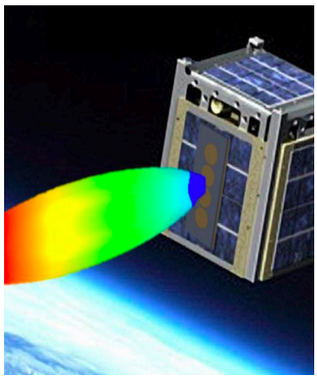
Faculty Advisor: *Dr. Khashayar Behdinan*

Team: *Ahmad Abdalraheem, Ali Aldashti, Faris Alhadeeb (Captain), Ahmad Almeteb, Abdulla Jaber*

Window Cleaning Robot [Team was not able to present - no video available]

Our product is a robotic window cleaning pole which works in a specific way by applying coding applications and weight control. This robot works with a battery that can be charged with having the lowest amount of wires. We can control it with a switch and all we need is water and power. One of the reasons we came up with this idea is because people sometimes find it hard to have free time to clean windows. In this case they might hire somebody to do the job for them and then pay for it. It is very smooth and useful for homes, buildings, etc.

ELECTRICAL & COMPUTER ENGINEERING (ECE)



Faculty Advisor: *Brad Jackson*

Team: *Austin Adam, David Allen, Christian Cavalier (Captain), David Deangelis, Joseph Dodson*

Smart Antenna for Small Satellites

Smart antennas combine antenna arrays with digital signal processing to enable the ability to sense the environment and dynamically adjust radiation characteristics. For example, if an interfering wireless signal is present, a smart antenna system could determine what direction the unwanted signal is coming from, and then configure its radiation pattern such that it minimizes the effect of this interference. In this senior design project, a smart antenna array was designed for application in a small satellite in cooperation with The Aerospace Corporation. The project included the design, simulation, and measurement of a circularly polarized antenna array and several microwave circuits, as well as the development of digital signal processing algorithms, and an automated testbed for characterizing the performance of the prototype in CSUN's anechoic chamber.

Faculty Advisors: *Dr. Ronald Mehler, Dr. Xiaojun Geng*

Team: *Jesus Adame, Carlos Benavides, Huy Dao, Andres Flores, Jagratrakesh Rao, Jimmy Salamanca (Captain), Malindra Senalankadhikara*

UAV DRONE

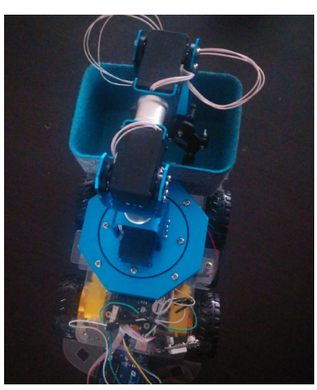
This AI-UAV Drone is meant to be used for mission completion, being able to travel from point A to point B without anyone manually flying it, relying solely on Python script fed to it through a companion computer. Using the Raspberry Pi 4 as our microcontroller we feed instructions into the Flight Controller (PIXHAWK 4) which controls the drone. We don't rely on any external sensors except for GPS and the PIXHAWK's internal sensors like its Barometer, Accelerometer, and Compass in order to have the drone performs its maneuvers.

Faculty Advisor: *Dr. Xiaojun Geng*

Team: *Alejandro Carmona, Mario Chang, Venkata Dinesh Reddy Chittela, Marian Giron (Captain), Yasmine Goudjil, Mohammad Hossain, Oscar Tejeda, Ridge Tejuco, Jonnathan Villalobos*

ARCS Project for Airborne Vehicle and Agnostic Sensor Integration Platform

Our project involves gathering different kinds of plug and play sensors for object collision avoidance, global positioning, and time stamping such as lidar, radar, sonar, thermal camera and pi cameras that will be eventually be integrated to a pallet design data acquisition system. The detachable pallet design with the sensors and power supplies needs to weigh at least 15 lbs. or must be able to adhere to the maximum payload of selected drone where the pallet will be attached. Since, our pallet will be attached to an airborne object, it must be able to reduce vibration therefore aerodynamic principles must be applied in creating the pallet. Once the integrated detachable pallet is made, extensive testing will be made which will involve gathering of data through various experiments keeping in mind the different scenarios and airborne obstacles while flying the drone. This will measure the accuracy and performance of all sensors.



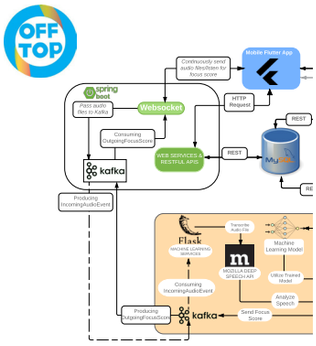
Faculty Advisor: *Dr. Shahnam Mirzaei*

Team: *Fahad Asat, Pascal Hessami, Kyle Keislar (Captain), Nolan Mirras, Igor Vdovchenko*

Autonomous Vehicle Tennis Ball Collector

The Autonomous Vehicle Tennis Ball Collector (AVTBC) is a self-ambulatory robot which detects, retrieves and stores tennis balls using various sensory systems and image processing technology. The AVTBC consists of a grabbing arm attached to a small robotic car which function to seek and extract tennis balls from a standard size hard court. By utilizing Arduino programmable logic controllers, ultraviolet sensors, LIDAR, rechargeable batteries and the Pixy2 smart vision sensor, the collector can operate unmanned and independently powered. Since its inception in November of 2019, the AVTBC project has been overseen by department faculty advisor Dr. Shahnam Mirzaei and realized with a dedicated team of five undergraduate Electrical Engineering and Computer Engineering students.

COMPUTER SCIENCE (CS)

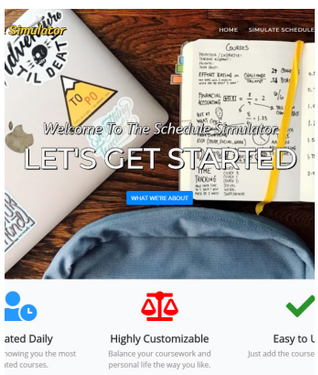


Faculty Advisor: *Dr. Steve Fitzgerald, Prof. Nerces Kazandjian*

Team: *Auhbon Amiri, Asbin Dahal, Henry Dinh, Zane Ervin, Joshua Magdaleno (Captain), Sarkis Mikaelian*

OFF-Top

We are creating a realtime productivity application that indicates whether or not a person stays on topic. OFF-TOP will monitor your speech, transcribe it and analyze the text to better predict when you're getting off task. We are utilizing modern technologies in the fields of Data Engineering, Machine Learning, Front-End & Back-End to create this sophisticated and realtime system.



Faculty Advisor: *Prof. Afshin Amini*

Team: *Nishant Bharat, Sanjaya Ghimire, Jorge Lopez, Alexandre Nacache, Kyle Nguyen (Captain)*

Schedule Simulator

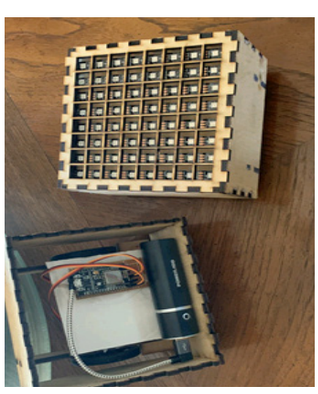
Schedule Simulator is a three tiered web based application that allows students attending CSUN a way to design a schedule that balances their coursework and daily routines. It is built using modern day technologies that provide simple and beautiful visuals that students would like to see in an application. It provides a simple and easier alternative from the tedious hours that students spend when designing their own schedules. They can create schedules by adding courses based on the current offered terms alongside any breaks from school that they may be obligated to and with a click away Schedule Simulator can take care of the rest based on the current course availability. All favorited schedules that the student add can be exported for future reference and schedules can be viewed in a tabular grid that can show their day to day schedule.

Faculty Advisor: *Prof. Afshin Amini*

Team: *Kian Bonakdar (Captain), Hossein Esmaeili, Iman Kiyanoush, Emen Saeidi, Shahin Sotoudian*

UDorm

UDorm is an app that intends to ease the communication and interaction between CSUN dorm residents and managers. The Manager app allows users dorm managers to interact with residents in ways such as sending out announcements, messaging students directly, receiving and assigning service requests, etc. On the Student version of the app, students are given the opportunity to schedule service requests and attach images from directly within the app, as well as a forum for interacting with other students in the dorms, along with many other options.



Faculty Advisor: *Prof. Afshin Amini*

Team: *Chase Gould, Andriy Korsun, Thomas Parashos (Captain), Isaac Teh*

Botfleet

Our project aims to create a system which can track and control a fleet of ground robots. This is done through three parts of the project: a fleet of bots, a station, and a user interface. The ground bots are servo driven and are controlled over wifi. The station sends commands to the bots and tracks their position using machine vision. The user interface provides an easy to use method of controlling the bots. These components together can be used to make the bots perform cooperative tasks, such as forming patterns.

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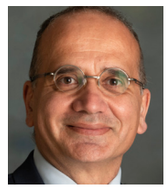
COLLEGE LEADERSHIP



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We are so proud of our students and faculty who were able to pivot to showcase their projects, despite all the challenges. This is truly a testament of their resilience, toughness, and how they react when faced with challenges.

Well done!

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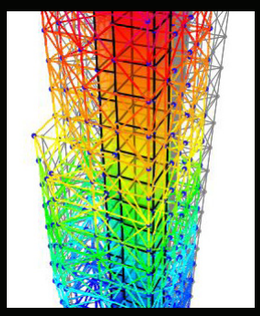
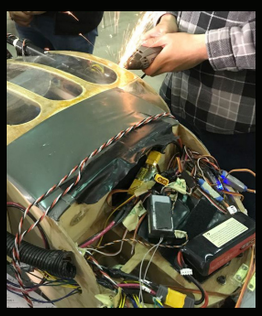
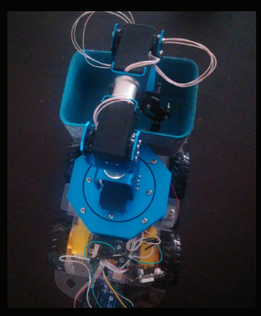
Thank you for joining us!







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