FRIDAY
APRIL 14
2017
1 - 5 P.M.
AT THE USU
NORTH RIDGE CENTER
AND GRAND SALON
Greetings,

On behalf of our students and faculty, I welcome you to our eighth annual 2017 Senior Design Project Showcase event from 1:00 p.m. – 5:00 p.m. on April 14, 2017 in the USU Northridge Center and Grand Salon at California State University, Northridge. This year’s SDPS features over thirty-six senior design projects from all the undergraduate programs in our college. Also, breakout sessions (oral presentations) have been planned where the top teams from each program as selected by the department/program have been invited to compete for prizes. As in past years, the projects will be judged by a distinguished panel of industry experts. You can find detailed information about the event on the web at http://www.csun.edu/engineering-computer-science/senior-design-project-showcase. It has been exciting to watch this event grow and expand over the years and is a testament to our hardworking students who are ably guided by our faculty and our supporters from industry.

By way of background, the College of Engineering and Computer Science is home now to almost 5,000 students and 66 full time faculty members, with active searches to fill six new faculty positions this fall. We offer ABET accredited undergraduate programs in Civil Engineering, Computer Science, Electrical Engineering, Computer Engineering, Manufacturing Systems Engineering and Mechanical Engineering. The Construction Management program is accredited by the American Council for Construction Education. The undergraduate programs in Engineering Management and Computer Information Technology were recently reviewed by ABET for inaugural accreditation and we expect that they will soon join the ranks of the other accredited programs in the college. We also offer several contemporary Master’s Degree programs such as our newly revamped Engineering Management program emphasizing entrepreneurship and innovation. The college graduates approximately 600 students annually from these programs to meet emerging workforce needs. Our students continue to garner accolades and recognition for their accomplishments at regional and national competitions and remain a shining testament to the "CSUN SHINE" vision articulated by our President Dr. Dianne Harrison. Graduates from the college’s programs serve in leadership positions in industry, government and academia.

This past year our proposal on "Bridging the Gap: Enhancing AIMS² for Student Success" was selected by the US Department of Education for a five year, $6 Million grant to bolster student success and support underrepresented minorities in engineering and computer science following in the footsteps of the nationally recognized AIMS² program in the college that was also funded by USDE in 2011. The new grant includes three additional community colleges and is designed to serve a significantly larger group of students through 2021. The program’s success is visibly demonstrated through signature events such as the annual research symposium where the students in the cohort present their research work through posters and presentations. Our Center for Entrepreneurship and Innovation hosted its fourth annual Art of Innovation Conference in October 2016 followed by our Energy Research Center that hosted its fourth annual conference on renewable energy and energy storage in November 2016. Thanks to these cutting edge conferences and symposia, and our faculty brown bag research seminars we have been exposing our students to the latest trends and advances in a variety of disciplines. And we are building up to a crescendo with SDPS 2017! Don’t miss this opportunity to see and hear firsthand from our outstanding students and soon to be graduates. I am sure you will be impressed with the diversity and quality of our student projects and look forward to seeing you on April 14th.

Sincerely,

[Signature]

S. K. Ramesh, Ph.D.
Dean
Thank you for your support!

Dr. Balaji Iyer

Aerojet Rocketdyne
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Former President & CEO  
Canoga Perkins  
[Retired]

VAUGHN CABLE (IAB CHAIR)  
Spacecraft Communications Systems & Operations Group  
Jet Propulsion Laboratory  
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RORY DEJOHN  
Senior Vice President  
Turner Construction Company

CHRISTOPHER M. ERICKSON  
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ROBERT P. FRUEHOLZ  
General Manager  
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NEAL GABORNO  
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MILAD GIRGIS  
Vice President Neuromodulation,  
International Sales, Deep Brain Stimulaiton  
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RONALD HARDGROVE III  
NH-04, Department of the Air Force Sensors  
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MARILEE WHEATON  
General Manager  
Systems Engineering Division  
The Aerospace Corporation

DAN WILDT  
Director  
Woodland Hills Engineering  
Northrop Grumman Corporation  
Mission Systems
Thank you Project Showcase Judges!
Faculty Moderators

Dr. Dale Conner
Manufacturing Systems Engineering and Management Department

Dr. Nazaret Dermendjian
Civil Engineering and Construction Management Department

Dr. Shadi Mahjoob
Mechanical Engineering Department

Dr. Robert McIlhenny
Computer Science Department

Dr. Shahnam Mirzaei
Electrical and Computer Engineering Department

Faculty Advisors

Dr. Rais Ahmad
Civil Engineering and Construction Management Department

Dr. Anwar Alroomi
Civil Engineering and Construction Management Department

Dr. Peter Bishay
Mechanical Engineering Department

Dr. David Boyajian
Civil Engineering and Construction Management Department

Prof. Thomas Brown
Mechanical Engineering Department

Prof. Patricia Dousette
Computer Science Department

Dr. Vibhav Durgesh
Mechanical Engineering Department

Continued on page 10
Faculty Advisors

Dr. Steven Fitzgerald
Computer Science Department

Dr. Sami Maalouf
Civil Engineering and Construction Management Department

Prof. James Flynn
Electrical and Computer Engineering Department

Dr. Ronald W. Mehler
Electrical and Computer Engineering Department

Dr. Xiaojun (Ashley) Geng
Electrical and Computer Engineering Department

Dr. Vidya Nandikolla
Mechanical Engineering Department

Dr. Ichiro Hashimoto
Electrical and Computer Engineering Department

Dr. Stewart Prince
Mechanical Engineering Department

Dr. Ruting Jia
Electrical and Computer Engineering Department

Prof. Felix Rabinovich
Computer Science Department

Dr. Sharlene Katz
Electrical and Computer Engineering Department

Dr. Kourosh Sedghisigarchi
Electrical and Computer Engineering Department

Prof. Aram G. Khachatourians
Mechanical Engineering Department

Dr. John Valdovinos
Electrical and Computer Engineering Department

Dr. Bingbing Li
Manufacturing Systems Engineering and Management Department

Dr. Tadeh Zirakian
Civil Engineering and Construction Management Department
SDPS 2017

Program
Friday, April 14, 2017

Display of Projects
(Projects in the process of being judged will not be available for display)
1:00 - 5:00 p.m.

Northridge Center, University Student Union
Civil Engineering & Construction Management
Manufacturing Systems Engineering & Management
Mechanical Engineering

Grand Salon, University Student Union
Computer Science
Electrical & Computer Engineering

Oral Presentations
(see page 12 for specific times for each project)

Civil Engineering & Construction Management
12:15 - 4:00 p.m.
USU Granada Room, Northridge Center

Computer Science
12:15 - 4:00 p.m.
USU Reseda Room, Northridge Center

Electrical & Computer Engineering
12:15 - 4:00 p.m.
USU Balboa Room, Northridge Center

Manufacturing Systems Engineering & Management
1:30 - 3:10 p.m.
USU Tujunga Room, East Conference Center

Mechanical Engineering
12:15 - 3:10 p.m.
USU Van Nuys Room, East Conference Center

Announcement of Awards
5:30 p.m.

Please see University Student Union (USU) map on page 12 for room locations.
Directions and parking information are on page 31.
Civil Engineering and Construction Management [USU Granada Room, Northridge Center]
12:40 - 1:00 PM Civil Senior Design
1:05 - 1:25 PM Communal Living Los Angeles
1:30 - 1:50 PM Concrete Canoe: Nimbus 2017
1:55 - 2:15 PM Homes of Los Angeles
2:50 - 3:10 PM Pomona College
3:15 - 3:35 PM Steel Bridge
3:40 - 4:00 PM Student Recreation Center

Computer Science [USU Reseda Room, Northridge Center]
12:15 - 12:35 PM Autonomous Car
12:40 - 1:00 PM Super One Punch Team Turbo HD Remastered II
1:05 - 1:25 PM AJAMKA
1:30 - 1:50 PM Living in Technology (LIT)
2:50 - 3:10 PM Salute
3:15 - 3:35 PM Tint
3:40 - 4:00 PM WeRide

Electrical and Computer Engineering [USU Balboa Room, Northridge Center]
12:15 - 12:35 PM Wireless Transcutaneous Power Transfer for Implantable Left Ventricular Assist Devices
12:40 - 1:00 PM CSUN UAV
1:05 - 1:25 PM Smart Restroom
1:30 - 1:50 PM Smart Home Management
1:55 - 2:15 PM Light Beam Communicator
2:50 - 3:10 PM AM/FM Receiver
3:15 - 3:35 PM Stereo
3:40 - 4:00 PM GPS

Manufacturing Systems Engineering & Management [USU Tujunga Room, East Conference Center]
1:30 - 1:50 PM Folding Electrical Bicycle
1:55 - 2:15 PM GardenBot
2:50 - 3:10 PM Robotic Arm

Mechanical Engineering [USU Van Nuys Room, East Conference Center]
12:15 - 12:35 PM Build a Better Box
12:40 - 1:00 PM Wheelchair Assist
1:05 - 1:25 PM CSUN Aeronautics
1:30 - 1:50 PM Human Powered Vehicle
1:55 - 2:15 PM Formula SAE Car
2:50 - 3:10 PM Smart Morphing Wing
Senior Design Projects
Three Story House

Project Description: Three story house with dimensions of 45X40 feet. The house can support itself with energy from the solar panels on the roof. The house also has a mechanic room that will provide electricity at night from the energy that stored in the day.

Civil Senior Design

Project Description: Three Story Residential House.
Homes of Los Angeles

Project Description: This group of projects started out as a simple exercise to get senior level undergraduate civil engineering students acquainted with wood and structural steel design in seismically active areas. Our first home was a simple two-story wood single family dwelling (SFD). From an architectural point of view, the two-story SFD includes a living area, kitchen, dining area, five bedrooms and three bathrooms. The roof is a simple truss system.

The other home featured wood, concrete and structural steel as building materials. From an architectural point of view, the two-story SFD flat roof structure includes living space, kitchen, dining area, four bedrooms and bathrooms. The openness, vegetation and the spaces for outdoor living are additional important components in this design. There are front and rear covered porches that satisfy these requirements. Other features include a swimming pool.

“Communal” Living Los Angeles

Project Description: Three-story Multiple Family Dwellings (MFD’s) flat roof structure include living space, kitchen, dining area, bedrooms, bathrooms, a study area, as well as green measures. It is an example on how future “communal” spaces are envisioned in Los Angeles. Resilience and sustainability include solar systems (generating electricity and heat), water reuse possibilities and roof gardens. These MFD’s use wood, recycled wood products, structural steel and concrete as building materials.
Pomona College

Project Description: The project our group has chosen is the New Pomona College Museum of Art building located in Claremont, California. This new museum facility will accommodate direct engagement with works of art, curricular use of collections and exhibitions, social and academic programs, community events, adequate storage and ease of access for a growing permanent collection of 11,000-plus objects. The goal of the project is to provide a building for presentation of a vibrant and engaging art program, and to accommodate changing exhibitions drawn from loans and permanent collections from near and far. The new Pomona College Museum of Art building will serve the Claremont colleges as well as the surrounding community.

The project will call for careful construction. There is a house on the existing site that will need to be moved, as well as many trees that need to be removed and transplanted. There is heavy HVAC on the project for the reason that many pieces of art in the facility are climate sensitive. In this report, one will find a bid package that consists of a project takeoff, detailed schedule, work breakdown structure, 3D BIM models, and a physical model.

Student Recreation Center

Project Description: The student recreation center was completed in 2012. Estimated construction costs were approximately $40-$45 million. The building is led gold certified as it incorporates many green features: the restrooms use little water, heavy use of glass for exterior applications reduce power usage, a state-of-the-art storm water collection system, etc. These and many other features make the SRC a very sustainable structure that is sure to lead the way to fully sustainable building on campus. It is a facility that promotes lifelong health and wellness. For this project, we are providing a detailed estimate of construction quantities and costs, a detailed schedule that outlines construction activities and their corresponding durations. We will deliver a scaled down physical iteration of the student recreation center, its surroundings, as well as provide computer generated 2d plans, 3d plans, and elevations.
Concrete Canoe: Nimbus 2017

**Project Description:** Each year, ASCE students chapters compete to do the impossible: make concrete float. Concrete Canoe challenges its members to innovate in hull design, mixes, and structural analysis. Additional project components are a technical design report as well as an oral presentation. Lastly, the canoe is put to the test in 2-person slalom-endurance, 2-person sprint, and 4-person coed races.

Steel Bridge

**Project Description:** Students are challenged to develop from conception and design through fabrication, erection, and testing to develop a steel bridge that meets client specifications and optimizes performance and economy. Students face real-world engineering issues such as spatial constraints, material properties, strength, serviceability, fabrication and erection processes, safety, esthetics, project management, and cost.
**Tint**

*Project Description:* Our project sets out to revolutionize the way consumers shop for clothing by allowing them to shop by color, exact color. Using our developed algorithms we generate color harmonies for you that match a pixel color you have selected. You are then allowed to select a type of clothing and will be returned all clothing articles that match that clothing type and color.

**Salute**

*Project Description:* Simulated and Live UAV Testing Environment (SALUTE) in a Human-Machine Teaming environment for Systems Engineering Research Laboratory (SERL)

**AJAMKA**

*Project Description:* A web application that provides a social platform focusing on helping people improve their lives, whether it is for themselves or for others. Our application strives to provide a convenient experience for the user through its excellent, and easy to use interface that seamlessly connects the social features together. Among other things, users can share stories, chat with each other, connect with mentors, play mind games, and track their progress in their journey to improvement.
Autonomous Car

Project Description: In the first release Fall 2016, we have finished the primary requirement of the car’s navigation with an obstacle avoidance feature that avoids the curbs. In the second release, at the end of Spring 2017, we will be adding extra car traffic, and a smart intersection to communicate with the cars that enter the intersection, to adjust their speed and avoid collision.

Living in Technology

Project Description: Living In Technology (LIT) is a home automation system built on a Raspberry Pi. The system has a web application as well as an android application that allows you to toggle your appliances from anywhere in the world. Third party support is being worked on so that you will be able to control all of your smart home appliances as well as our own system from one platform.

Super One Punch Team Turbo HD Remastered II

Project Description: We are making a 2D fighting / platform game titled: Super One Punch Team Turbo HD Remastered II. The game includes interesting characters and level design along with multiplayer, singleplayer and controller support.
Social Media Analyzer

**Project Description:** The social media analyzer is a project designed to use machine learning technologies and strategies to glean insight into how the public as a whole feels about certain important topics and current events.

WeRide

**Project Description:** A directions sharing app. It will allow a group of people with the same destination in mind, to share the location of said destination and the directions to get there. Intended to be used to coordinate travel for groups of people with multiple cars.
**Digital Recorder**

*Project Description:* A digital voice recorder that must hold an hour in length at minimum. It has playback and erase capabilities.

**FM Transmitter**

*Project Description:* FM transmitter. Frequency range 88-108 MHz. Following FCC regulations.

**GPS**

*Project Description:* This group will design a GPS receiver capable of displaying any position inside LA county within 100 ft both longitude and latitude.

**Light Beam Communicator**

*Project Description:* The light beam communicator project is meant to be able to send an audio signal through the air using light beam transmission.
**AM/FM Receiver**

**Project Description:** Our AM/FM receiver will take inputs into the Arduino Mega that will go through the RF filter, demodulator, Dolby logic decoder, and the amplifier to output noise based on which channel was selected on the Arduino. We will be using an Arduino Mega, trimmer capacitor, tsot-6 to dip board, 16x2 lcd screen, 4x4 keypad, soic to dip, a RF filter, demodulator, Dolby 2.1, and a class D amplifier to build this receiver.

**TEAM MEMBERS**
Luis Chavez  
Woo Baek Kang  
David Lo  
Andres Ochoa  
Erica Peters (Captain)

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**Stereo**

**Project Description:** A sound amplifying system consisting of 5 components: Preamplifier, Equalizer, Crossover, Power amplifier, and Speaker.

**TEAM MEMBERS**
Yousef Abdullah  
Sylvan Alora  
Ryan Barry  
Joseph Mongillo (Captain)  
Christian Ngiyulu  
Garrison Tran

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**Smart Restroom**

**Project Description:** Most custodial plans are largely “open loop”: spaces are cleaned based on a time schedule rather than use or need. This approach is a static compromise that often under serves heavily used spaces, wastes water, produces unnecessary pollutants, and fails to adapt to changing traffic and use patterns. This project will develop a proof-of-concept system using sensor and communications technology to close the loop in this process, ultimately yielding a smarter, green cleaning program for campus restrooms.

**TEAM MEMBERS**
Armen Arslanian (Captain)  
Liudmila Eckel  
Robert Morris  
Keelan Paraja  
Cris Sicat  
Sylvia Trinh

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**Wireless Transcutaneous Power Transfer for Implantable Left Ventricular Assist Devices**

**Project Description:** For patients with end stage heart failure, there are few existing treatment options besides transplant. One solution, however, is treatment via LVAD (Left Ventricular Assist Device). There are numerous problems surrounding current methods of implementation of an LVADs, such as high morbidity rates due to infection caused by the transcutaneous cable running to the device from an external power supply. Attempts to wirelessly power these mechanical devices continue to be explored. Wireless power transfer via inductively coupled coils has shown promising results in modern study. A device that wirelessly powers the Jarvik 2000 Pediatric LVAD has been built to specifically serve pediatric audiences. The device is capable of delivering more than 7.5W at a distance of 1.0 cm consistently at 300 kHz with an efficiency of 48%.

**TEAM MEMBERS**
Arabo Keshishi  
Tommy Khamlue  
Andy Nguyen  
Nolyn Preston  
Tom Ziccardi (Captain)
CSUN UAV

Project Description: The CSUN UAV is currently a hexacopter (soon to be quadcopter) that will compete in the International Aerial Robotics Competition for Mission 7. Mission 7 challenges teams to demonstrate three new behaviors that have never been attempted in any of the past six IARC missions. First, "interaction between aerial robots and moving objects (specifically, autonomous ground robots). Second, navigation in a sterile environment with no external navigation aids such as GPS or large stationary points of reference such as walls. Third, interaction between competing autonomous air vehicles."

Micromouse

Project Description: The micromouse is a completely autonomous robot that must find its way from a predetermined starting position to the central area of the maze unaided. The mouse will need to keep track of where it is, discover walls as it explores, map out the maze and detect when it has reached the goal. Having reached the goal, the mouse will typically perform additional searches of the maze until it has found an optimal route from the start to the center. Once the optimal route has been found, the mouse will run that route in the shortest possible time.

Smart Home Management

Project Description: The goal of this project is to develop smart devices that will monitor and control home energy consumption. Also, this information will be accessible to the home owner using a smart device. The user also has the option to be able to remotely turn off home applicances to reduce the energy consumption when not used. Monitoring power usage will allow the user to save energy and money on his energy bills. In addition, energy savings help to reduce burdens on power networks, increase system efficiencies and preserve the environment.
**Folding Electrical Bicycle**

*Project Description:* The agenda of our group for this week was to solve the battery’s problem, collect all the needed items to start manufacturing the electrical folding bicycle, and then to start the manufacturing process.

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**GardenBot**

*Project Description:* Advancements in agriculture technology have allowed farmers to better plant and treat their plants since the beginning of the professional practice of agriculture. We can take FarmBot as a great example of autonomous machine backyard gardening. This team is focusing on building an autonomous machine for backyard gardening with a simpler, cheaper, and better size for GardenBot.

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**Robotic Arm**

*Project Description:* Industrial Robots are expensive for the average consumer and hobbyist. Robotics is a growing field in the manufacturing sector that many companies, students, and individuals will benefit from utilizing, but the costs are very steep. Working around robotic machinery can also be dangerous. The purpose of this project is to build a low cost, 5 degree of freedom robot arm for educational and research purposes, to tighten bolts and nuts on a wooden work bench with an automated bolt dispenser. The arm must also lift 2kgs and be safe to operate.
MECHANICAL ENGINEERING

FACULTY ADVISOR
Dr. Stewart Prince

TEAM MEMBERS
Adnan Adlooshi
Abdulmohsen Alabdu Irazzaz
Onoud Alali
Khaled Albanai
Meshal Aldasem
Abdulrahman Aldosari
Khaled Aldouji
Fawaz Alfashouti
Ali Alfayez
Ali Alherz
Fawaz Alhomoud
Shouq Almaboub
Hamdan Almazrouei
Ali Almer
Sultan Almutairi
Khaled Alnnaimi
Mohammad Alobaid
Fars Alqabandi
Othman Alrashed
Azzam Alsharif
Omar Alshatti
Humood Alshayea
Abdulaziz Alshlawi
Obaid Alsubaie
Dhari Alsubeah
Ali Alathou
Martha Alvardo
Ahmed Alzaabi
Abdulrahman Alzewawi
Abrar Awadh
Fahad Ben Awadh
Cory Bryant
Elden Cartwright
Ivan Chavez
Luis Chavez
Tyler Chavez
Fahad Dean
Jorge Diego
Musaed Hafidh
Hugo Hernandez
Samuel Hollis
Hassan Jamal
Francisco Legorreta
Jorge Macias (Captain)
Ryan Malooly
Dean Mavrakis
Ricky Miranda
Fawaz Mohammed
Humberto Mora
Quan Nguyen
Miguel Perez
Pedro Ramirez
Cesar Roja
Hamad Saleh
Jose Tovar
Paulo Trentini Filho
Devin Venhuizen
Matthew Yarlot
Bandar Yousef
Christopher Zendejas

FSAE

Project Description: Formula SAE (FSAE) is an annual engineering student based design competition held by SAE International. The concept of the competition is that a fictional manufacturing firm has appointed a design team, Matador Motorsports, to produce a prototype formula-style race car based on a set of rules.

Here at California State University, Northridge, the FSAE program is one of many capstone projects available through the department of Mechanical Engineering. This project requires the knowledge and theory gained from the mechanical engineering curriculum. Students work with state-of-the-art equipment to manufacture their designed components. This teaches them the benefits of simple practical designs and ease of manufacturing. Furthermore, the FSAE experience entails managing cost, fitting each individual’s design into the overall assembly, and testing the components.

The design and fabrication of the FSAE racecar takes place over a period of nine months and is used as a training ground for young engineering students in preparation for the immensely competitive engineering industry. Hands on experience is crucial for students before entering the work field. Restrictions are placed on the design of the car in order to test the student’s ingenuity for maximizing the vehicle’s performance. This project develops essential skills used by engineering firms, from the design process to fabrication: each step of this project takes cost, ease of manufacturing, and vehicle performance into consideration. Once our racecar has been designed, manufactured, and tested, the team travels to the SAE competition in Lincoln, Nebraska to compete against engineering schools from all over the world in static and dynamic events.

The image shows a group of students from the FSAE team.
**Build a Better Box**

**Project Description:** Retrofit Design-Build & Construction Management of an existing SAE -20F vehicle test chamber (primary function) / coatings application booth (secondary function) into a multi-functional composite wet layup booth (primary function) / clean room standards lab (secondary function) in support of modern engineering curriculum while enhancing safety and quality of student and instructor activity. Primary project requirements include various innovation iterative efforts throughout the assessment phase of the project; vetting of design concepts and innovations with Faculty and Professional volunteers; final element and system design and performance assessment; as appropriate hands on construction / retrofit means and methods activities and oversight and control / management (safety) standards and applications of the same.

**Wheelchair Assist**

**Project Description:** Our mission is to design a wheelchair that will assist and give independence to people who have a disability or are recovering, and find it very hard to stand up and walk a few steps.
HPV Team

Project Description: The California State University, Northridge (CSUN) Human Powered Vehicle Team has designed and manufactured “The Deadliest Khach” during the 2016-2017 academic year, following the mission statement developed by team members: “To continue the growth and excellence of CSUN’s Human Powered Vehicle (HPV) Challenge team, with the goal of producing a competitive vehicle, and in the process, forging engineering students who enter the workforce as industry leaders”.

With this goal in mind, the team has committed themselves to maintaining our award winning 1st place position nationwide. Students have worked very hard to design, fabricate and test a hybrid frame that reduces the overall vehicle weight; produce a fairing that is very effective, and utilize components that are lightweight and provide mechanical advantage to the vehicle & rider. This year’s vehicle innovation involves a self-steering system. Anyone who may have vision impairment will be able to ride the vehicle in a safe environment and enjoy the experience that some of us may take for granted. We are introducing technology that is going to be available in cars in the future, into our HPV.

CSUN’s HPV team competed in the annual Human Powered Vehicle Challenge in Las Vegas, Nevada on March 17-19, 2017 against engineering schools from different universities both from US and the rest of the world. It obtained the 1st place title once again.
MECHANICAL ENGINEERING

FACULTY ADVISOR
Dr. Vibhav Durgesh

TEAM MEMBERS
Khalid Alghammas
Mohammad Alkandari
Jeric Baylon
Pablo Díaz (Captain)
Cesar Dominguez
Ahmed Ebrahim
Jayson Farin
Andrew Fechtner
Melvin Fuentes
Alfred Javier
Tyler Keppel
Daniel Lopez
Manuel Masihmirzakhan
Frank Mejia
Christopher Moore
Kendall Rettig
Wendy Reynaga
Eddie Rodriguez
Muhammad Zaheer

CSUN Aeronautics

Project Description: This project introduces students to challenges in the field of aeronautics. It goes hand in hand with the SAE Design West Competition, in which students from around the world compete in the design and manufacturing of an unmanned aircraft capable of lifting at max 55lbs per FAA regulations. With constraints placed by the competition, the aircraft must be capable of releasing at minimum of 2 payloads onto a 60ft target from 100ft up in the air. Students implemented innovative ideas such as an autonomous drop mechanism, vortex generators, hybrid aircraft structure consisting of composites, 3D printed parts and metal, and a custom tuned exhaust system.

FACULTY ADVISOR
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Jessica Shaffstall
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Ari Sugmad
Alex Tamrazian (Captain)
Sergio Valenzuela
Mhartie Viray

Smart Morphing Wing

Project Description: The objective of the Smart Morphing Wing Senior Design Project is to design, build, and test morphing wing designs utilizing smart materials and/or structures. The motivation for the designs of these morphing wings are (1) to create aerodynamically efficient wings at more than one flight condition (take-off, cruise, landing, etc.). (2) to create seamless wing surfaces that avoid drag induced by discrete control surfaces. (3) to use smart materials, structures and actuators to deform the morphing wings in order to reduce the weight penalty and maintain high fuel efficiency. The developed morphing wing designs utilize shape memory alloy (SMA) wires, macro-fiber composites (MFC), and Zero Poisson's ratio structures, in addition to rigid, flexible and soft composite structures and 3D printed components of different materials. The project is divided into five teams working on five different morphing wing designs: Span Morphing, Twist Morphing, Camber Morphing, Sweep Morphing, and Morphing Winglets. All teams compete at the AIAA Student Conference Region VI and present their work at CSUNposium.
Humans on Mars used to be science fiction, Aerojet Rocketdyne is developing systems and technologies to make it a reality.

rocket.com
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Senior Design Project Showcase
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2. Park in Lot G3.

3. Walk to the University Student Union (USU)

To support Senior Design Project Showcase, please contact Mr. Malik Sooch, College Development Director, at 818.677.3850 or by email at malik.sooch@csun.edu.

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