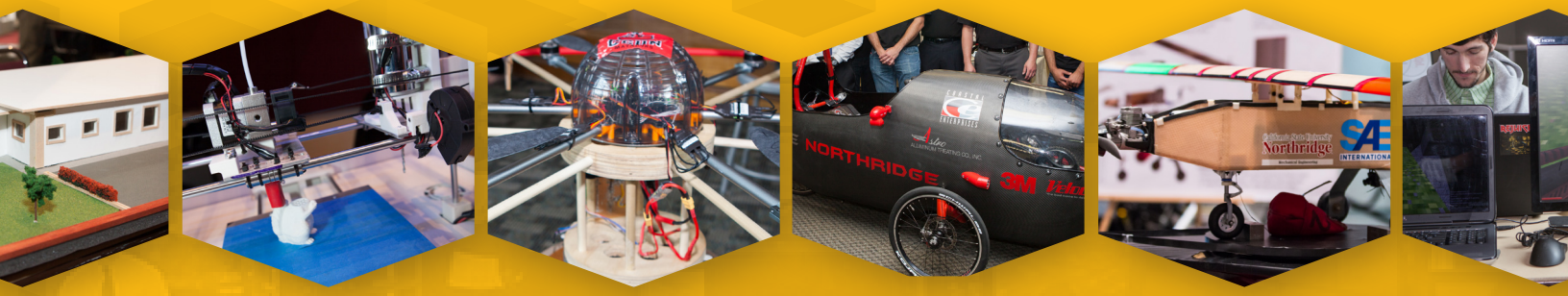
SDPS 2016

Senior Design Project Showcase



FRIDAY, APRIL 15, 2016, 1 - 5 P.M. • USU NORTHRIDGE CENTER AND GRAND SALON

CSUN | COLLEGE OF **ENGINEERING AND COMPUTER SCIENCE**

Dean's Message

Greetings,

On behalf of our students and faculty, I welcome you to our seventh annual 2016 Senior Design Project Showcase event from 1:00 p.m. – 5:00 p.m. on April 15, 2016 in the USU Northridge Center and Grand Salon at California State University, Northridge. This year's SDPS features 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 www.ecs.csun.edu/ecs/sdps. 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 three 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. Our Construction Management program is accredited by the American Council for Construction Education. We also offer several contemporary Master's Degree programs that are designed to meet emerging workforce needs. The college graduates approximately 600 students annually from these programs. 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 saw the College's AIMS² program funded by the US Department of Education receive national recognition as a Bright Spot in Hispanic Education from the White House Initiative for Educational Excellence for Hispanics for its efforts to bolster student success and support underrepresented minorities in engineering and computer science. Our Energy Research Center hosted its third annual conference on renewable energy and energy storage in February 2015, followed by our Center for Entrepreneurship and Innovation that hosted the third annual Art of Innovation Conference in October 2015. Thanks to such cutting edge conferences and our increasingly popular 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 2016! 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 15th.

Sincerely,

S. K. Ramesh, Ph.D.
Dean

CSUN | COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

18111 Nordoff Street · Northridge · California 91330-8295 · (818) 677-4501 · fax (818) 677-2140

Senior Design Project Showcase is sponsored by:

AEROJET ROCKETDYNE

Aleratec®
www.aleratec.com
The Prosumers' Choice

Boston Scientific
Advancing science for life™

NORTHROP GRUMMAN

Turner

Individual Donor

Mr. Jack Buhn
Consultant, Canoga Perkins
Fiber Optic Data Communications
College Industry Advisory Board Member

We are grateful for your support!

Table of Contents

Contents

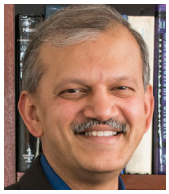
Dean's Message	*3*
Sponsors	*4*
College Leadership	*6*
College Industry Advisory Board	*7*
Judges and Faculty Moderators	*8*
Faculty Advisors	*9*
Program	*11*
Schedule of Oral Presentations	*12*
Senior Design Projects	*13*
Civil Engineering & Construction Management Projects	*14*
Computer Science Projects	*16*
Electrical & Computer Engineering Projects	*19*
Manufacturing Systems Engineering & Management Projects	*23*
Mechanical Engineering Projects	*24*

Location

University Student Union (USU) map	*12*
Directions and Parking Information	*31*

College Leadership

DEAN
Dr. S. K. Ramesh
818.677.4501
s.ramesh@csun.edu



ASSOCIATE DEAN
Dr. Robert Ryan
818.677.2183
robert.ryan@csun.edu

DEVELOPMENT DIRECTOR
Mr. Malik Sooch
818.677.3850
malik.sooch@csun.edu

CIVIL ENGINEERING & CONSTRUCTION MANAGEMENT (CECM)
Dr. Nazaret Dermendjian (Chair)
818.677.2166
nazaret.dermendjian@csun.edu

COMPUTER SCIENCE (CS)
Dr. Richard Covington (Chair)
818.677.3398
cov@csun.edu

ELECTRICAL & COMPUTER ENGINEERING (ECE)
Dr.George Law (Chair)
818.677.2190
george.law@csun.edu

MANUFACTURING SYSTEMS ENGINEERING & MANAGEMENT (MSEM)
Dr. Ahmad Sarfaraz (Chair)
818.677.2167
sarfaraz@csun.edu

MECHANICAL ENGINEERING (ME)
Dr. Hamid Johari (Chair)
818.677.2187
hjohari@csun.edu

College Advisory Board

Industry Advisory Board (IAB)

ADEBOLA (BOLA) AYORINDE
Region Manager
DC&M North Coast
Southern California Edison

J. F. (JACK) BUHN
Consultant
Canoga Perkins
Fiber Optic Data Communications

VAUGHN CABLE (IAB CHAIR)
Spacecraft Communications Systems &
Operations Group
Jet Propulsion Laboratory
California Institute of Technology

RORY DEJOHN
Senior Vice President
Turner Construction Company

CHRISTOPHER M. ERICKSON
Chief Engineer
Energy & Advanced Programs
Aerojet Rocketdyne

NEAL GABORNO
Program Chief Engineer
SAS Systems Verification Center
Raytheon Company

MILAD GIRGIS
Vice President Neuromodulation,
International Sales, Deep Brain Stimulaiton
& Program Management
Boston Scientific Neuromodulation

RONALD HARDGROVE III
NH-04, Department of the Air Force Sensors
Flight Test Expert
Edwards Air Force Base

BALAJI IYER
Associate Director
Airborne Electronic Attack Division
Naval Air Warfare Center Point Mugu

GARY MALLALEY
Program Director
LN-25x Fiber Optic Gyro Programs
Northrop Grumman Corporation
Navigation Systems

NICK MANSUR
Vice President Engineering
AeroVironment

MICHAEL C. McALPINE
Vice President, Project Executive, CM
Construction Management Division –
Western Territory
STV, Inc.

CAROLE MORTON
President
Salt Interprises

PEGGY NELSON
Consultant

NAOMI PALMER
Section Manager
Power and Sensor Systems
Jet Propulsion Laboratory

FELIX RABINOVICH
Director, Product Development
ATIMS

A. F. (RICK) RATCLIFFE
Dean Emeritus
College of Engineering & Computer Science
California State University, Northridge

DUTCH SCHULTZ
Program Management Office - Fiber
Ericsson

PERRY SOLOMON
President & CEO
Aleratec, Inc.

CHARLES VOLK
Vice President and Chief Technologist
Northrop Grumman Corporation
Navigation Systems

MARILEE WHEATON
General Manager
Systems Engineering Division
The Aerospace Corporation

Judges

Lisa Bayne
Mechanical Engineer
Combustion Devices Design
Aerojet Rocketdyne
Mechanical Engineering
Liaison Council

Vijay Bhatt
Founder and CEO
E-Contek
Electrical and Computer Engineering
Liaison Council

Rayna Burgess
Software Engineer
Indegene

Vaughn Cable
Spacecraft Antenna Research Group
Caltech-JPL
College Industry Advisory Board (Chair)
Electrical and Computer Engineering Liaison Council

Luis Carbajo
IEEE LA Council Chair

Kunal Chitre
Account Executive
Siemens Infrastructure & Cities (IC)

Tuan Dinh
Haas Automation

Michael Dipsia
Branch Chief
Senior Construction Engineer
Department of Transportation

Luis Echeverria
Northrop Grumman Corporation
Manufacturing Systems Engineering
& Management Liaison Council

Christopher M. Erickson
Chief Engineer, Future Programs
Aerojet Rocketdyne
College Industry Advisory Board

Jorge Eroza
Chief Financial Officer
San Fernando Pallet Company
Manufacturing Systems Engineering
& Management Liaison Council

Linda Friedman
Director, Software & Systems Engineering
Northrop Grumman Navigation Systems
Computer Science Liaison Council

Neal Gaborno
Senior Manager
SAS Systems Verification Center
Raytheon, Space and Airborne Systems
College Industry Advisory Board
Computer Science Liaison Council

Shahzain Husain
Sapphire Engineering Co. Inc.

Balaji Iyer
Associate Director
Airborne Electronic Attack Division
Naval Air Warfare Center Point Mugu

Muthu Jeganathan
Supervisor, Optical and Opto-mechanical
Design and Engineering Group
Jet Propulsion Laboratory (JPL)

Al Khella
TDD Process Engineer
3M Drug Delivery Systems Division

Michael C. McAlpine
Vice President, Project Executive
Construction Mgmt. Div., Western Territory
STV Construction, Inc.
College Industry Advisory Board
Construction Management Technology
Advisory Board

Vahag Minassian
Project Manufacturing Engineer
Northrop Grumman Corporation
Manufacturing Systems Engineering
& Management Liaison Council

Lief Morin
President
Key Info

Naomi Palmer
Section Manager
Power and Sensor Systems
Jet Propulsion Lab (JPL)
College Industry Advisory Board

Felix Rabinovich
Director, Product Development
ATIMS
College Industry Advisory Board

Dutch Schultz
Program Management Office - Fiber
Ericsson
College Industry Advisory Board

Todd Uramoto
Manager, Engineering Operations
Northrop Grumman Electronic Systems

Charles Volk
Vice President and Chief Technologist
Northrop Grumman Navigation Systems
College Industry Advisory Board

John Wright
Hartzell Aerospace

Thank you Project Showcase Judges!

Faculty Moderators

Rais Ahmad
Civil Engineering & Construction Management

Ruting Jia
Electrical & Computer Engineering

Vidya Nandikolla
Mechanical Engineering

Diane Schwartz
Computer Science

Maryam Tabibzadeh
Manufacturing Systems Engineering & Management

Faculty Advisors

Dr. Rais Ahmad
Civil Engineering and Construction Management Department

Dr. Peter Bishay
Mechanical Engineering Department

Dr. David Boyajian
Civil Engineering and Construction Management Department

Prof. Patricia Dousette
Computer Science Department

Dr. Vibhav Durgesh
Mechanical Engineering Department

Dr. Steve Fitzgerald
Computer Science Department

Prof. James Flynn
Electrical and Computer Engineering Department

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

Dr. Ichiro Hashimoto
Electrical and Computer Engineering Department

Dr. Nhut Ho
Mechanical Engineering Department

Dr. Ruting Jia
Electrical and Computer Engineering Department

Dr. Adam Kaplan
Computer Science Department

Dr. Sharlene Katz
Electrical and Computer Engineering Department

Continued on page 12

Faculty Advisors

Prof. Aram G. Khachatourians
Mechanical Engineering Department

Dr. George Law
Electrical and Computer Engineering Department

Dr. Bingbing Li
Manufacturing Systems Engineering and Management Department

Dr. Sami Maalouf
Civil Engineering and Construction Management Department

Dr. Ronald W. Mehler
Electrical and Computer Engineering Department

Dr. Abhijit Mukherjee
Mechanical Engineering Department

Dr. Jack Ou
Electrical and Computer Engineering Department

Dr. Stewart Prince
Mechanical Engineering Department

Prof. Felix Rabinovich
Computer Science Department

Dr. David Schwartz
Electrical and Computer Engineering Department

Dr. Tadeh Zirakian
Civil Engineering and Construction Management Department

SDPS 2016

Program

Friday, April 15, 2016

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
1:00 - 2:50 p.m.
USU Reseda Room, Northridge Center

Computer Science
1:00 - 3:15 p.m.
USU Van Nuys Room, East Conference Center

Electrical & Computer Engineering
1:00 - 3:40 p.m.
USU Tujunga Room, East Conference Center

Manufacturing Systems Engineering & Management
1:00 - 1:45 p.m.
USU Granada Hills Room, Northridge Center

Mechanical Engineering
1:00 - 3:15 p.m.
USU Lake Balboa Room, Northridge 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.

Oral Presentations

Oral Presentation Schedule

Civil Engineering and Construction Management *[USU Reseda Room, Northridge Center]*

1:00 - 1:20 p.m.	*ADA-Compliant Accessory Dwelling Unit*
1:25 - 1:45 p.m.	*Economical Steel Bridge Design and Construction*
1:50 - 2:10 p.m.	*Homes of Los Angeles*
2:30 - 2:50 p.m.	*Concrete Canoe*

Computer Science *[USU Van Nuys Room, East Conference Center]*

1:00 - 1:20 p.m.	*SmartMirror*
1:25 - 1:45 p.m.	*EventStream*
1:50 - 2:10 p.m.	*Learning, Classifying and Recognizing Bot (LCAR Bot)*
2:30 - 2:50 p.m.	*CSUNSat1*
2:55 - 3:15 p.m.	*Team Cayley*

Electrical and Computer Engineering *[USU Tujunga Room, East Conference Center]*

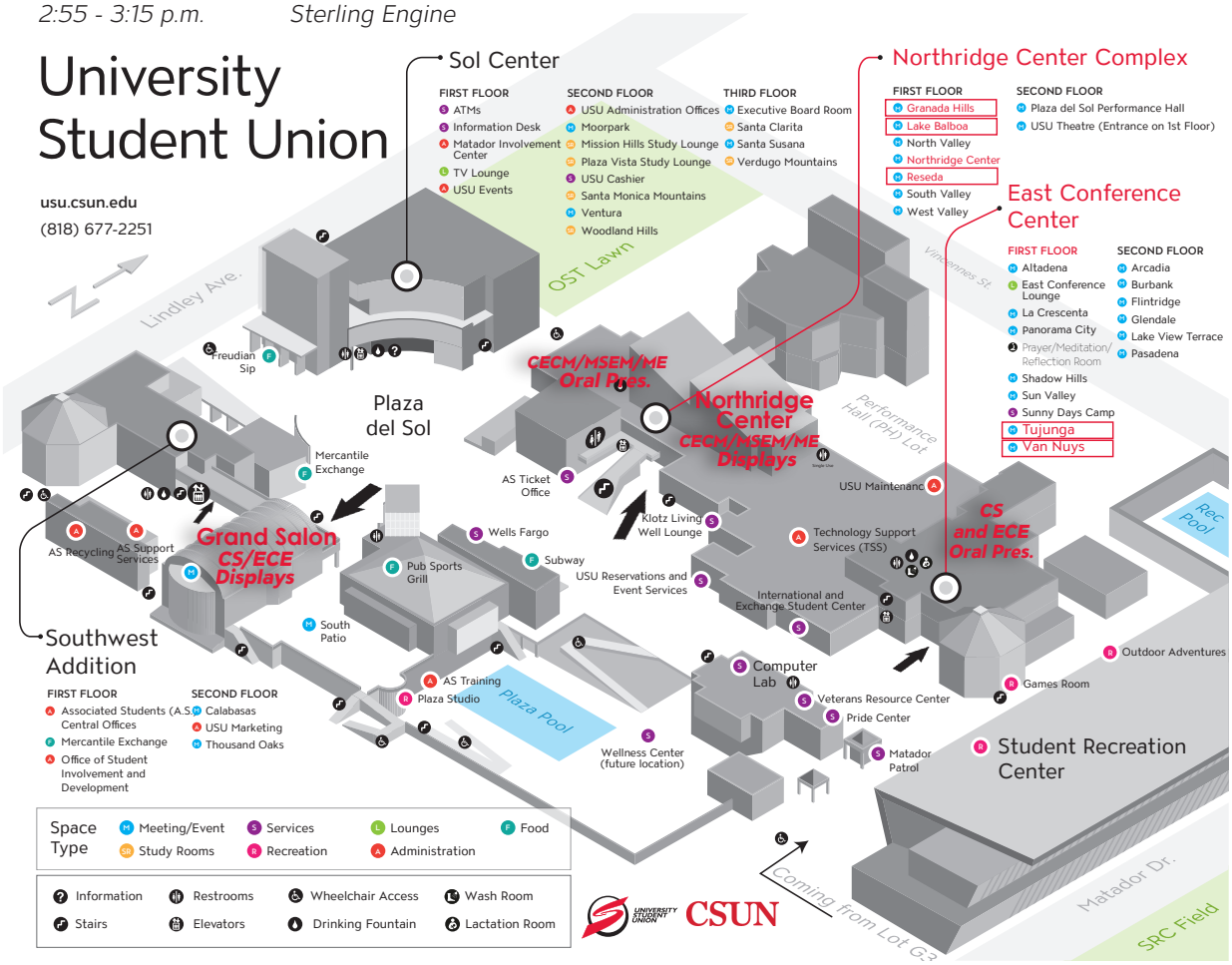
1:00 - 1:20 p.m.	*Digital Recorder*
1:25 - 1:45 p.m.	*Modular Solar Powered Water Pump System*
1:50 - 2:10 p.m.	*UAV*
2:30 - 2:50 p.m.	*CSUNSat1*
2:55 - 3:15 p.m.	*Home Stereo System*
3:20 - 3:40 p.m.	*AM/FM Receiver*

Manufacturing Systems Engineering & Management *[USU Granada Hills Room, Northridge Center]*

1:00 - 1:20 p.m.	*CSUN Cloudponics*
1:25 - 1:45 p.m.	*Home Health Care System (HHCS)*

Mechanical Engineering *[USU Lake Balboa Room, Northridge Center]*

1:00 - 1:20 p.m.	*2016 Human Powered Vehicle Challenge*
1:25 - 1:45 p.m.	*SEARCH :Station for Exploratory Analysis and Research Center for Humanity*
1:50 - 2:10 p.m.	*SAE Aero Senior Design 2015-2016*
2:30 - 2:50 p.m.	*Mechanical Engineering Laboratory Rejuvenation Project*
2:55 - 3:15 p.m.	*Sterling Engine*



Senior Design Projects

ADA-Compliant Accessory Dwelling Unit

FACULTY ADVISORS

Dr. David Boyajian
Dr. Sami Maalouf
Dr. Tadeh Zirakian

TEAM MEMBERS

Michele Glidden (Captain)
Razan Khalil
Kevin Liu
Andrew Slusser
Anthony Talebian

Project Description: *This project started out as a simple exercise to get senior level undergraduate civil engineering students acquainted with wood design in seismically active areas.*

An accessory dwelling unit (ADU) is a second dwelling unit created on a lot with an existing or proposed single family dwelling (house). The second unit is created auxiliary to, and is smaller than, the main dwelling. ADUs can be created in a variety of ways. Our accessory dwelling units (ADUs) are simple one-story wood frame. From an architectural point of view, the one-story ADU features a maximum of 600 SF space that includes a living area, kitchenette, dining area, a bedroom and bathroom. The roof is a simple flat roof system.

ADA compliant ADUs are homes that include features that make it more user-friendly for a handicapped human being. Our architectural design incorporates smart ideas and functions including no-step entries, wider doorways and hallways, open floor and other features. This home style is perfect for people with medical or orthopedic challenges. Our structural design is simple, economical and one that uses locally-available building materials (concrete foundation and wood frame).

Concrete Canoe

FACULTY ADVISORS

Dr. Rais Ahmad
Dr. David Boyajian
Dr. Sami Maalouf
Dr. Tadeh Zirakian

TEAM MEMBERS

Catherine Adrover
Daniel Akmakjian
Gabriel Bonilla
Dannick Castaneda
Phat Duong (Captain)
Cristian Duran
Julio Iglesia
Sara Lopez
Joe Medina
Valeria Padilla
Ernesto Pedroza
Jecsan Perez
Joel Plascencia
Sam Potts
Claris Rivera
Paul Rivera
Hani Salhab
Miguel Sanchez
Jose Sanchez
Nicole Thompson
Soledad Tlamasico
Francisco Villalobos
Julie Yin
Nikki Zulueta

Project Description: *Each year, the American Society of Civil Engineers (ASCE) challenges students to design, construct, and race a canoe cast entirely using lightweight concrete.*

Using ASCE regulations, the competition allows students to further develop their engineering skills. This includes discovery, problem identification, solution plans, implementation, analysis and interpretation. Working together, the team is able to analyze and develop an efficient canoe design which can in turn be used to build a product that can withstand hydrodynamic forces, one that is stable and can propel across coastal waters.

Homes of Los Angeles

FACULTY ADVISORS

Dr. David Boyajian
Dr. Sami Maalouf
Dr. Tadeh Zirakian

TEAM MEMBERS

Ameer Almalla
Sayed Sulaiman Alqallaf
Thamer Mohammed H. Balharith
Dina Rabadi
Masoud Razavi (Captain)
Nicole Thompson

Project Description: *This group of multilple projects started out as a simple exercise to get senior level undergraduate civil engineering students acquainted with wood, concrete 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 two homes featured concrete and structural steel as building materials. From an architectural point of view, the two-story SFD flat roof concrete structure includes living space, kitchen, dining area, living area five bedrooms, five bathrooms and two powder rooms. 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 and guest house.

The three-story SFD flat roof steel structure include living space, kitchen, dining area, one bedroom, a study area, as well as green measures (roof garden and solar systems that generate electricity and heat).

Economical Steel Bridge Design and Construction

FACULTY ADVISOR

Dr. Rais Ahmad
Dr. David Boyajian
Dr. Sami Maalouf
Dr. Tadeh Zirakian

TEAM MEMBERS

John Copello
Ahmed Guerrero
Claris Rivera
Luis Molina
Rigoberto Torres (Captain)

Project Description: *The American Society of Civil Engineers (ASCE) and the American Institute of Steel Construction (AISC) challenge and sponsor civil engineering students nationally to design, fabricate and construct a structural steel bridge, on an annual basis.*
The ASCE CSUN Steel Bridge team was tasked with designing and constructing of an economical and versatile bridge that adapts to different locations. In order to prove the feasibility of design, we were asked to construct a 1:10 scale model to demostrate the concept. Unique challenges for this year include a viable design that accommodates challenging site conditions. There are restrictions on transportation, site layout, temporary support, and access over water. Serviceability, construction cost and duration, material cost, and aesthetics are also critical considerations. Steel is specified for ease of prefabrication, rapid erection and superior strength to weight ratio.

EventStream

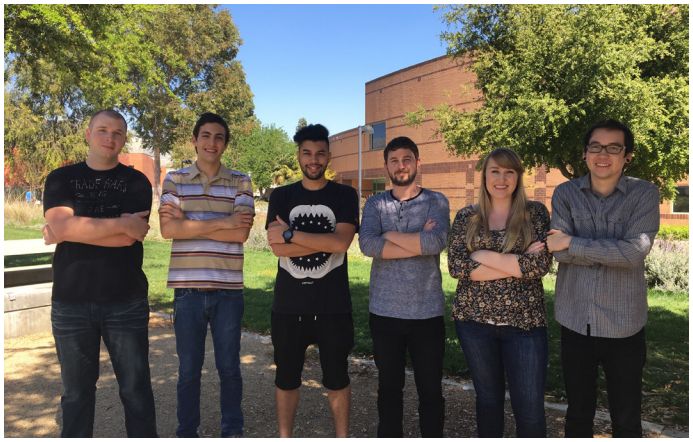
FACULTY ADVISOR

Prof. Felix Rabinovich

TEAM MEMBERS

Kira Anderson
Kevin Baktiar
Brian Dunham
Hazim Rekab
Jaren Rowan (Captain)
Chris Schultz

Project Description: *A mobile Android application that allows users to seamlessly share photos within a group of users. In the application, users can create or join an event. Users attending an event will be able to upload photos to the event's shared photo repository if the user is within the event's location radius and timeframe of the event. Users in the event can view the repository, through a real-time stream of photos, and download photos that other users submitted.*



Learning, Classifying and Recognizing Bot (LCAR Bot)

FACULTY ADVISOR

Dr. Nhut Ho

TEAM MEMBERS

Steve Delgado
Jake Hanvey
Thomas Jentis
Karanvir Panesar (Captain)
Edwin Portillo
Hovig Shahbazian
Nathaniel Wilson
Bryan Wong

Project Description: *The project aims to develop a Machine Learning capable Quadrotor that can autonomously scout a target building for entry points such as doors. In addition, custom Ground Control Station software is created to allow for command and control of all vehicles in the system.*

MusicPlayer++

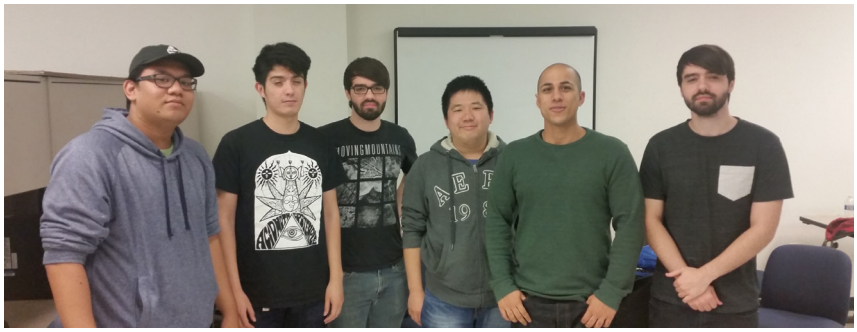
FACULTY ADVISOR

Prof. Felix Rabinovich

TEAM MEMBERS

Shayan Bozorgmehri
Jeremy Galarza (Captain)
Gerard Pallones
Art Sintoplertchaiyakul
Jack Westlake
Luke Westlake

Project Description: *MusicPlayer++ is an application for Android mobile devices which seeks to offer functionality far beyond the average music player. In addition to standard features such as library organization, playlist creation, and the ability to search, MusicPlayer++ will allow users to view lyrics, music videos, and metadata for each song in their library through the use of tools such as the Youtube Android Player API and the MusicBrainz database.*



PartyQ

FACULTY ADVISOR

Dr. Steve Fitzgerald

TEAM MEMBERS

Frank Addelia
Stefan Eng
Marco Jonker (Captain)
Alex Kolesnik
Andrew Maynard
Narbeh Movsesian

Project Description: *A live social playlist that allows people to add songs and vote on the order that they are heard... Because the party is better when you're the DJ.*

SmartMirror

FACULTY ADVISOR

Dr. Steve Fitzgerald

TEAM MEMBERS

David Barsda (Captain)
Luiz Guzman
Navin Row
Harout Ter-Papyan

Project Description: *SmartMirror is an android-powered information appliance which is both a regular household mirror and an internet-connected assistant. It is controlled entirely by voice command or a separate remote control application, and displays the current weather, news and traffic. It can also show the user's Gmail, Google Calendar, Facebook, and Twitter feeds. The 'Photos' mode will show your photos stored in the cloud, and Gallery mode presents a selection of famous artwork. Finally, it can take pictures through the integrated camera, and store them to your online folder.*

Team Cayley

FACULTY ADVISOR

Prof. Patricia Dousette
Dr. Nhut Ho

TEAM MEMBERS

Aaron Cho
Ernest Curioss
Blake Davison
Daniel Dilanian (Captain)
Tariq Soliman
Eric Tapia

Project Description: *The Cayley Project aims to create a personal assistant, namely Cayley, for an intelligent air traffic controller (ATC) responsible for multiple UAVs at once. Cayley will serve not as a tool but as a supporting team member of the ATC with the purpose of easing the work of the ATC by possessing the ability to perform tasks at hand and provide solutions to emergency situations with minimal surveillance by the ATC. Furthermore, it will be able to alert the ATC only when it is most necessary. Cayley will ultimately replace the need for multiple ATCs with a single ATC for the same or even greater number of UAVs.*

Nexus Gaming

FACULTY ADVISOR

Prof. Patricia Dousette

TEAM MEMBERS

Benjamin Dluzak
Alexander Hall
David Kopp (Captain)
Raffi Nalbandian
Vahan Tokadjian
Phillip Tran

Project Description: *Nexus Gaming is a social gaming community website. Nexus allows players to make an account that will enable them to setup a personal page which provides various information about themselves in regard to gaming. Some of the features offered to registered users are an editable personal page, character statistical information, personal community rating, message system, and schedule matching. The most innovative feature that Nexus offers is schedule matching. Schedule matching allows a user to match their game playing schedule with other users. The website allows unregistered users, or visitors, the ability to search and view any registered user's page. In addition, visitors are able to access statistical information on a player's characters from games like Diablo 3, League of Legends, and World of Warcraft. Each game's page contains a news feed that updates visitors with the latest patch information. A community forum also exists to facilitate the sharing of information and knowledge about game strategy, team recruitment, in-game guild or clan raid events, practice game Twitch feeds, or upcoming MLG, Major League Gaming, events.*

NEXUS
Social Gaming Site

AM/FM Receiver

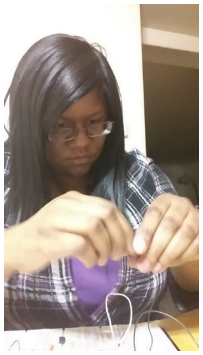
FACULTY ADVISOR

Dr. Ichiro Hashimoto

TEAM MEMBERS

Dominique Carter-Mitchell
Kenn Hernandez (Captain)
Dennis La
Nicholas Van Stryk

Project Description: *AM/FM Receiver with a tuning section that provides a digital readout of the station selection for both AM and FM. It will drive two channels and a separate subwoofer channel. It will include standard RCA jack with a speaker.*



CSUNSat1

FACULTY ADVISOR

Prof. James Flynn
Dr. Adam Kaplan
Dr. Sharlene Katz
Dr. David Schwartz

TEAM MEMBERS

Armen Arslanian
Rosy Davis
Sandra Dheming Lemus, CS
Timothy Friedman, CS
Gary Gamble
Cesar Garcia, CS
Nereida Herrera
Matthew Ingram
Phuoc Ma
Priya Malavia, CS (Captain)
Jobeth Palacio
Clifford Williams

Project Description: *Satellite hardware/software designed and built entirely by CSUN students and professors*

Note: *This is an interdisciplinary project. CS team members will do a separate Oral Presentation and will join the team for the project display portion of the competition.*

Digital Recorder

FACULTY ADVISOR

Dr. Ichiro Hashimoto

Project Description: *Digital recorder that records in mp3 format and contains playback capabilities.*

TEAM MEMBERS

Rashed Alzahrani
Basim Bahmeed
Daniel Le
Justin Mendoza
Deven Simmons (Captain)

Digital Spectrum Analyzer

FACULTY ADVISOR

Dr. Ichiro Hashimoto

Project Description: *The purpose of this experiment is to build a digital device that displays the frequency components of a physical circuit and produce a function generator.*

TEAM MEMBERS

Abdulla Al-khayarin
Ramez Armanyous
David Bates
Eric Webb (Captain)

Modular Solar Powered Water Pump System

FACULTY ADVISOR

Dr. George Law

Project Description: *This solar powered system is programmed to pump water from a source into a reservior under a specified condition. The system will track the sun while charging a rechargeable battery. A Raspberry Pi running Linux is programmed is C++ and controls the system. Magzor Integrated Circuit (MIC) boards will drive motors and interface with sensors. A display outputs battery infromation.*

TEAM MEMBERS

Jose Baez (Captain)
Joel Fischetti
Jireh Christine Imperial
Brian Lee
Jong Jin Lee
Edwin Rebollo

GPS

FACULTY ADVISOR

Dr. Ichiro Hashimoto

Project Description: *Small handheld GPS device calculating longitude and latitude.*

TEAM MEMBERS

Narek Abrahamian (Captain)
Rashed Alajmi
Omar Alzaid
Andre Villa

Home Stereo System

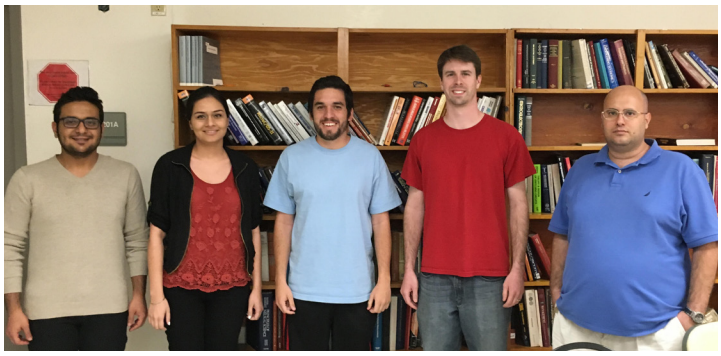
FACULTY ADVISOR

Dr. Jack Ou

Project Description: *The design and construction of a complete home stereo system from preamp through equalizer, crossover, power amps and speakers.*

TEAM MEMBERS

Faisal Almughyirah
Joel Crisler
Louay Farchoukh
Ravikiran Kaur
Daniel Rivera



Light Beam Communicator

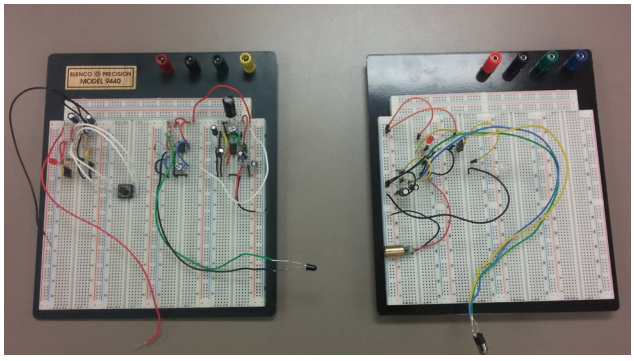
FACULTY ADVISOR

Dr. Ichiro Hashimoto

Project Description: *To transmit an audio signal through light over 100 feet to a speaker.*

TEAM MEMBERS

Essa O. OAlessa
Bernardo Gonzalez
Arman Hayrikian
John A. Mumford (Captain)



Micromouse

FACULTY ADVISOR

Dr. Ruting Jia

TEAM MEMBERS

Tadiyos Yonas Alemu
Abdulrahman Alothman
Abdulrahman Alsubaie
Eric Camarillo
Aleksandra Gryunshpan
Kevin Joyce
David Raysh
Alex Resendiz
Tony Stevenson (Captain)

Project Description: *Our group will be participating in the Micro-mouse competition. The objective is to design and build an autonomous robotic "mouse" that negotiates a maze of standard dimensions from a specified corner to its center in the shortest time.*

NOAA Weather Radio

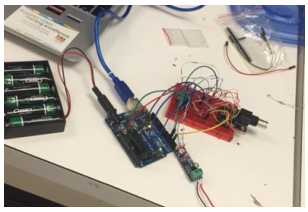
FACULTY ADVISOR

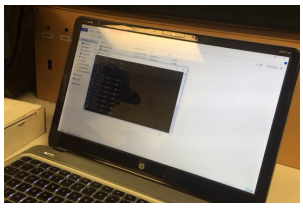
Dr. Ichiro Hashimoto

TEAM MEMBERS

Alwaleed Almuhanna (Captain)
Ziyad Alyahya
Walter Ayala
Ehsan Heydarpour

Project Description: *NOAA weather radio all hazards (NWR) is a nationwide network of radio stations broadcasting continious weather information directly from nearest national weather service office NWR broadcasts official weather service warnings, watches, for casts and other hazardous information 24 hours a day seven days a week.*
known as the "voice of NOAA national weather service" NWR is provided as a public service but the national oceasnic and atmospheric administration (NOAA) part of the department od commerce. NWR includes thousands of transmitters covering all fifty states, adjacent coastal waters, porto rico, the US Virgin islands, and the US Pacific teretories. NWR requires a special radio reciever or scanner capable of picking up the signal. Broadcasts are found in the VHF public service band at seven frequencies in MHz.





UAV

FACULTY ADVISOR

Dr. Xiaojun (Ashley) Geng
Dr. Ronald W. Mehler

TEAM MEMBERS

Tina Boyajian
Stanley Cho
Tam Dinh
Kevin Duenas
Amir Jahanfard
Heston Jayasinghe
Antonio Martinez (Captain)
Ismael Mendoza

Project Description: *Autonomous Aerial Vehicle used in a 20x20 meter arena using image processing to track targets on the ground and interact with them, through the use of microprocessor and autopilot devices to instruct the UAV on necessary actions. Included in the design is an electrical killswitch that will disable the UAV at any time via the use of a remote.*

CSUN Cloudponics

FACULTY ADVISOR

Dr. Bingbing Li

TEAM MEMBERS

Hyunjin Kim
Michael Mora (Captain)
Navjeevan Sandhu
Rodrigo Soltero

Project Description: *This design aims to create an aquaponics system that utilizes cloud computing principals in order to optimize and improve the outputs of the aquaponics system. Similar aquaponics systems with similar agriculture goals can be linked together in order to aggregate greater sets of data in shorter periods of time while simultaneously making operational adjustments based off of collected data.*

Delivery Hexa-copter

FACULTY ADVISOR

Dr. Bingbing Li

TEAM MEMBERS

Turki Alhodhaibi (Captain)
Mohammed Almalki

Project Description: *Hexa-copter that can deliver packages. The goal of the project is to securely deliver items while reducing time of delivery. The project can be used by shipping company, General Public as well as any institutions interested in Drones*

Manufacturing Systems Engineering & Management

FACULTY ADVISOR

Dr. Bingbing Li

Home Health Care System (HHCS)

Project Description: *This design aims to bring together different medical devices and components (first aid kit, pill organizer, blood pressure monitor, etc.) in order to ensure suitable health conditions and provide necessary items for injuries. Simulatenously, health data will be gathered and stored in order to see the individual's progress and improvement.*

TEAM MEMBERS

Abdulaziz Alhekeir (Captain)
Musaad Alrasheed
Tarik Alsalloom
Gilbert Maldonado
Laura Saldarriaga

Mechanical Engineering

FACULTY ADVISOR

Dr. Abhijit Mukherjee

Sterling Engine

Project Description: *To explore alternative forms of energy using solar power to heat a sterling engine.*

TEAM MEMBERS

Sonia Abdul (Captain)
Fahad Almuqait
Jack Barrientos
Rajpreet Chehal
Yu-Han Chuang
Hoosheng Ding
Vanesa Gomez
Ty Ishimoto
Anibal Martinez
Kathleen Prado
Mike Prusmack (Captain)
Matthew Villa
Haimanot Wubishet

2016 Human Powered Vehicle Challenge

FACULTY ADVISOR

Prof. Aram Khachatourians

TEAM MEMBERS

Brian Albarracin
Alan Alcocer
Benjamin Bell
Daniel Cabrera
Eric Figueroa
Rachel Foreman
Mihran Kechichian
John Kok
Armando Lagunas
Jonathan Lo
Alexis Marquez
Cassandra Mathison
Kevin Matsuno
Steven Molumby
Nancy Nodal
Angel Sevilladiaz
Mark Shipman
William Steed
Nami Taghavi
Robert Timm
Robert Vallet (Captain)

Project Description: *The California State University, Northridge (CSUN) Human Powered Vehicle Team has designed and manufactured "The Khach" during the 2015-2016 academic year, following the team determined mission statement:*

"Earn respect through professionalism, creativity, and the design & manufacturing of a competitive vehicle to participate at the 2015-2016 ASME Human Powered Vehicle Challenge"

With this goal in mind, the team was divided into five sub-teams: Components, Faring, Frame, Innovation, and Systems. Optimization was the overall goal for each team. This goal was implemented to improve on the 2014-2015 vehicle design as well as to utilize data collected on other vehicles from the 2015 competition. In particular, enhancing vehicle safety and practicality as a form of everyday transportation were paramount in this design process.

Last year's innovation placed CSUN's team in first position from a total of 36 participating schools. Continuing on that momentum, this year's team has chosen The Autonomous Break Assist System (ABAS) as the innovation that will once again impress the judges and gain us the top position. The idea for this innovation came from an accident that took place last year at the speed event. A vehicle lost control and collided with one of the ASME judges while traveling at speed of 38 mph, sending her to the operating room. Our ABAS continuously senses objects in front of the vehicle and using a very complex logic, analyzes the live data and distance from the object. If the object moves away or distance increases, there is no action taken. However, if the object is approaching, the break system is automatically engaged without any input from the rider, bringing the vehicle to a safe stop and preventing an accident from occurring.
CSUN's HPV team will compete in the Human Powered Vehicle Challenge at San Jose, California on April 22-23, 2016 against engineering schools from all over the world in such events as: Design, Speed, Endurance and Innovation. We plan on holding onto our first position in the innovation event, and finishing in top three overall.

Formula SAE

FACULTY ADVISOR

Dr. Stewart Prince

TEAM MEMBERS

Christopher Al massoud
Mohammad Alharbi
Mohamed Alhosani
Abdulaziz Almasuod
Hassan Al-sulaiti
David Arias
Roberto Arreola
Hector Avelar
Fahad Ballaith
Leo Bislig
Carlos Caldera
Dora Chavez
Calvin Cieslak
Sinuhe Contreras
Christopher Crawford
Hunter Dahl
Richard Dinsmoor
Sevak Fagerian
Jose Garay-Lozano
Jesse Guerrero
Evelyn Gutierrez
Katelyn Humphrey
Nicholas Hyland
leon Kozlowski
Saudiq Lawal
Ruben Longoria
Eriberto Lopez
Frans Maniago

Project Description: *To use the cumulative knowledge of our engineering studies to design, manufacture, assemble, and race a Formula style vehicle in an International competition held in Lincoln, Nebraska.*

TEAM MEMBERS continued...

Scott Marino (Captain)
Raul Martell
Antonio Martinez
Eric Melendez
Derek Mock
Francisco Olvera
Jakob Orkin
Pablo Pastrano
Gregory Petchakan
Jorriel Purugganan
Eberardo Ramosflores
Salvador Rivas
Silvio Santinelli
Mario Solorzano
Ivan Soriano
Delbert Stewart
Steven Toma
Carliano Varona
Nathan Watanabe

Mechanical Engineering Laboratory Rejuvenation Project

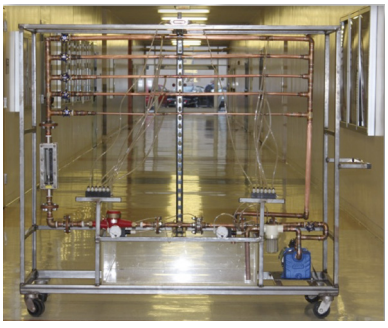
FACULTY ADVISOR

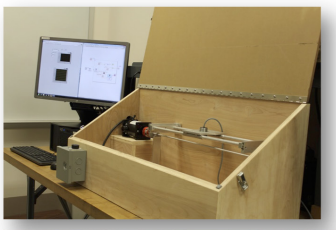
Dr. Vibhav Durgesh

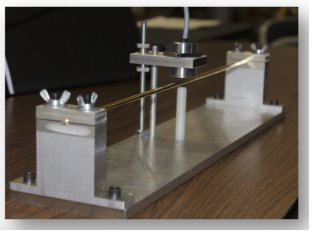
TEAM MEMBERS

Mohammad Aldousari
Ali Alhajeri
Mohammad Alherz
Farag Alkatan
Khalid Almarzooqi
Fawaz Alomair
Faisel Altawheed (Captain)
Ali Dashti
Sevan Dersarkissian
Reef Hashem
Eric Minn

Project Description: *The senior design project focused on rejuvenating existing mechanical engineering undergraduate instruction laboratories by designing and creating new sets of experiments for the ME 335 and ME 491 laboratory classes. The new experiments will be included in the curriculam by Fall 2016. The three newly designed projects are: (1) Flow Rate and Friction Factor experiments for ME 491 Thermal-Fluids Lab, (2) Critical Speed of Shaft experiments for ME 335 Measurements Lab, and (3) Damping Coefficient experiments for ME 335 Measurements Lab.*







SAE Aero Senior Design 2015-2016

FACULTY ADVISOR

Dr. Vibhav Durgesh

TEAM MEMBERS

Abraham Agopian
Anwar Alonazi
Hasan Alsaleh
Mher Asadourian
Ahmed Baaqeel
Ryan Bokhour
Henry Colindres
Nimi Fafowora
Eddie Garcia
Elifalet Garcia
Devon Jansen
Nate Klapp
Hagop Mertekhanian
Ismael Moreno
Carlos Nuno
Horizon Poudel
Omar Qureshi
Mario Rodriguez
Cynthia Sosa
David Sosa
Zach Stiegler
Wilson Tang (Captain)
Parker Van Dyke
Travis Van Leeuwen

Project Description: *The Aerospace Senior Design Team was tasked to design, fabricate, and build an aircraft to release multiple payloads from a height of 100 ft. The lifting capabilities of this aircraft are 35 lbs with a wingspan of 125 in and a chord length of 12 in. Our main inspiration for innovation for this aircraft was the concept of biomimicry through the use of a foam core covered in fibreglass for the wing design. All major components for the aircraft were designed in-house using composite material to optimize the weight of the aircraft while maintaining structural integrity.*

SEARCH :Station for Exploratory Analysis and Research Center for Humanity

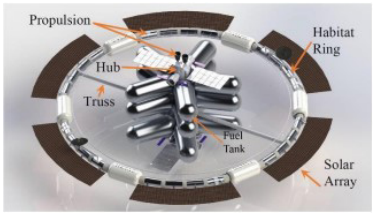
FACULTY ADVISOR

Dr. Peter Bishay

TEAM MEMBERS

Ahmad Alhaila
Mohammed Alkandari
Ebraheem Allanqawi
Abdulaziz Alrashed
Megerditch Arabian
Melissa Ayral
Brian Bolves
Claudiu Caldarescu
James Chan
Jesse Correll
Matthew Decker
Ricky Dinger
Jorge Garcia
Randall Harrington
Dosan Jyenis
Edward Kocharyan
Joseph Lewis
Maite Lopez
Jorge Ortiz
Rizel Podadera
Gary Sanders
Josef Staley
Francisco Tadeo
Qianyi Teng
Joshua Werner
Jasmine Wong (Captain)

Project Description: *A long-term, earth-independent, space-based architecture that can provide a continuous 1G environment may be the only viable solution to mankind's expansion. The Station for Exploratory Analysis and Research Center for Humanity, SEARCH, provides an Earth-independent architecture for a Lunar-orbit-based community of 16-24 people in a 1G environment. Advancements in technology, data on human reproduction in an artificial 1G environment, and knowledge of the physiological, psychological, and sociological effects due to long term community isolation are priceless benefits that will result from SEARCH's 55 year mission.*



Boston Scientific

Advancing science for life™

As a leader in the global medical device field and a large employer in the Santa Clarita Valley, we are dedicated to transforming lives through innovative medical solutions that improve the health of patients around the world.

©2016 Boston Scientific Corporation or its affiliates. All rights reserved.

THE VALUE OF BUILDING PARTNERSHIPS FOR STRONGER COMMUNITIES.

Whether it's providing real-time disaster assessment for faster relief efforts, or extending situational awareness to a global scale, Northrop Grumman's innovative technologies enable decision-makers to act with unrivaled speed, confidence and precision. *That's why we've become a leader in Unmanned Systems, Cyber, C4ISR and Logistics.*

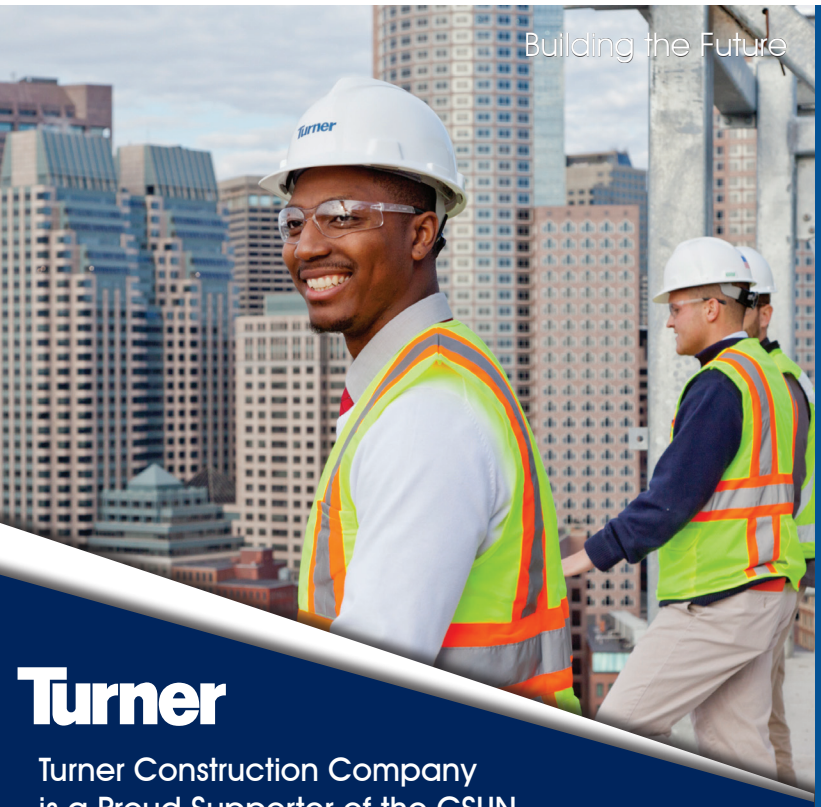
THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

www.northropgrumman.com

CSUN | COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

WE WISH TO THANK OUR SUPPORTERS
AND CONGRATULATE OUR SENIORS
ON THEIR ACCOMPLISHMENTS!



Turner

Turner Construction Company
is a Proud Supporter of the CSUN
2016 Senior Design Project Showcase

1900 S State College Blvd, Suite 200
phone: 714.940.9000
www.turnerconstruction.com

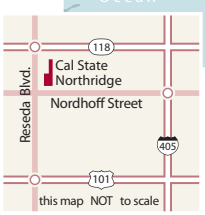
CSUN | COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

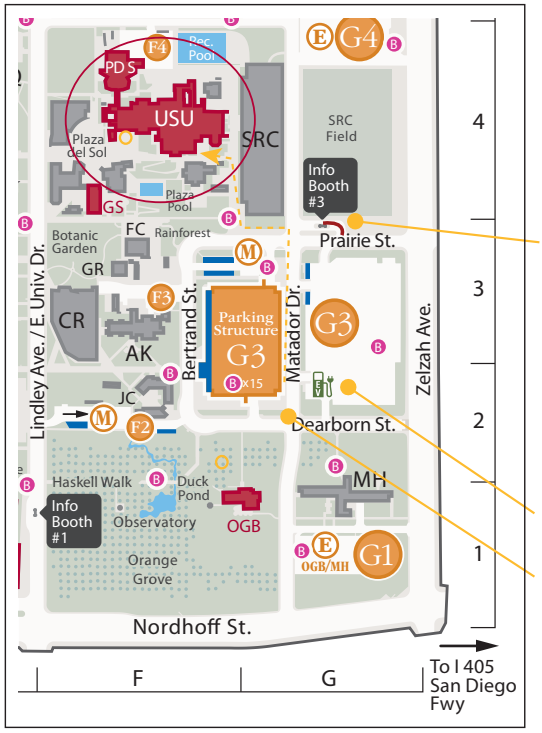
Congratulations Seniors!

Best Wishes,

Aleratec®
www.aleratec.com

Directions and Parking Information





CSUN

18111 Nordhoff Street
Northridge, California 91330
www.csun.edu

College of Engineering & Computer Science

Senior Design Project Showcase

Parking Information

1. Purchase parking permit at Information Booth ($6/permit, cash only).

   You can also purchase a parking permit at a permit dispenser located at each level of the parking structure ($6 per permit, cash and credit cards are accepted).

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.

To donate online visit:
https://givenow.csun.edu/

SDPS
2016