California State University
Northridge

SENIOR DESIGN

'10 Projects Showcase

USU Grand Salon, April 30, 2010, 1:00 to 5:00 p.m.

College of Engineering & Computer Science

Civil Engineering & Applied Mechanics

Computer Science

Electrical & Computer Engineering

Manufacturing Systems
Engineering & Management

Mechanical Engineering

http://www.ecs.csun.edu/ecsdean/docs/Projects_Showcase_Final.pdf

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

S. K. Ramesh
Dean

Shoeleh Di Julio
Associate Dean

CIVIL ENGINEERING & APPLIED MECHANICS

Stephen Gadomski
Chair

Nazaret Dermendjian
Associate Chair

CONSTRUCTION MANAGEMENT TECHNOLOGY

Mohamed Hegab
Program Director

COMPUTER SCIENCE

Steven Stepanek
Chair

ELECTRICAL & COMPUTER ENGINEERING

Ali Amini
Chair

MANUFACTURING SYSTEMS ENGINEERING & MANAGEMENT

Behzad Bavarian
Chair

MECHANICAL ENGINEERING

Hamid Johari
Chair

You are invited...

Greetings,

On behalf of our students and faculty it is my pleasure to invite you to the inaugural College of Engineering and Computer Science Senior Projects Showcase event on April 30th, 2010, featuring projects from all the undergraduate programs in the College. With over 2,600 students and 60 full time faculty members we offer ABET accredited undergraduate programs in Civil Engineering, Computer Science, Electrical Engineering, Computer Engineering, Manufacturing Systems Engineering and Mechanical Engineering. Our Construction Management Technology program is presently being reviewed for accreditation by the American Council for Construction Education. The college also offers several contemporary Masters Degree programs that are designed to meet emerging workforce needs. US News and World Report ranked the college 38th in the nation overall, 14th among all public colleges, and 5th in California in the category of colleges offering baccalaureate and masters degree programs.

Engineering and Computer Science holds the key to the future of our state and the nation. The latest estimates from the Bureau of Labor Statistics indicate that California needs approximately 7,500 engineers and computer scientists annually to meet emerging workforce needs over the decade from 2008-2018. Our College graduates approximately 400-450 students annually to meet those emerging needs with several graduates serving in leadership positions in industry, government, and academia. The programs in our college are renowned for their blend of theory and "hands-on" experience. As you can see from the schedule, the student projects are diverse and interesting and cover a wide range of areas. Several students have won recognition at regional and national competitions for their innovative projects.

The event on April 30th will include demonstrations and displays as well as breakout sessions with oral presentations where the top teams from each program as selected by the department/program have been invited to compete for prizes. In 2004 former US Secretary for Education, Richard Riley, said "We are educating students using technologies that haven't been invented yet, for jobs that don't exist yet, solving problems that they don't know are problems yet". The educational programs in our College are a testament to the statement by Secretary Riley. Please join us on April 30th so you can see and hear first hand from our outstanding students.

Sincerely,

S. K. Ramesh

S. K. Ramesh, Ph.D.,
Dean

SENIOR DESIGN

10 Projects Showcase

College of Engineering & Computer Science

Event Schedule - April 30, 2010

1:00 - 5:00 p.m.	Display of all Projects *University Student Union - Grand Salon*

Senior Design Oral Presentations

1:30 - 3:20 p.m.	Mechanical Engineering Projects (4 groups presenting) *USU Ventura Room*
1:30 - 2:50 p.m.	Electrical & Computer Engineering Projects (3 groups presenting) *USU Santa Susana Room*
1:30 - 2:20 p.m.	Civil Engineering Projects (2 groups presenting) *USU Executive Board Room*
3:30 - 4:20 p.m.	Manufacturing Systems Engineering (2 groups presenting) *USU Ventura Room*
3:00 - 4:20 p.m.	Computer Science Projects (3 groups presenting) *USU Santa Susana Room*
2:30 - 3:20 p.m.	Construction Management Projects (2 groups presenting) *USU Executive Board Room*
4:45 p.m.	Announcement of Awards

Note: The schedule above is subject to change and new projects might be added to the ones listed in this booklet. Please check back prior to the event to make sure you have the latest information.

For directions and meeting room locations, please see maps at the back of this booklet.

Senior Design Projects

CIVIL ENGINEERING & APPLIED MECHANICS

Serene Stage Park

Stephen Gadomski
Faculty Advisor

Students

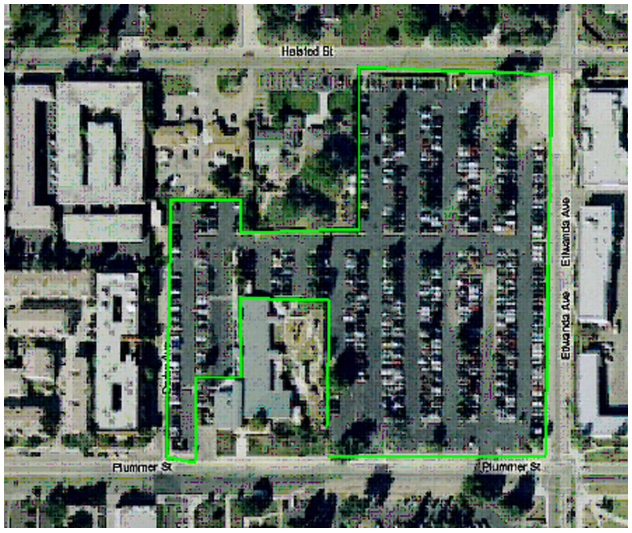
Grant Michael Dalton, Arutyun Ipchyan, Jorge Luis Jimenez, Fatemeh Noroozi Idlou, Nima Parsa, and Thomas Joseph Tan

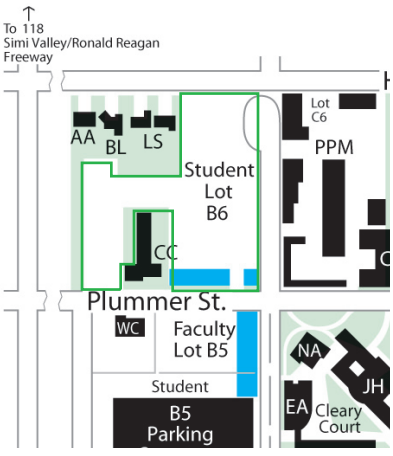
Eilan Aronianpour, Fadi Azzam Bader, Mario Correas, Nicholas Joseph Mineo, Abdullah Sadozai, Paul Starr, Sara Maribel Villegas, and Fayez Said Zorob

The civil engineering senior design project is to design suitable construction documents for an existing parking lot into a sustainable green space. This area is required to be an outdoor area where people may visit, picnic, and enjoy the outside space, but must include improvements to the streets bordering the area. One of the main goals is to incorporate sustainable construction methods. In addition, the project is to be developed in a way that minimizes construction impacts to the adjacent property owners.

Students must also include structural analysis and plans for the pedestrian overpass over Plummer Street as well as the pedestrian foot bridge(s) within the site. This structure is to incorporate Americans with Disabilities Act (ADA) requirements as well as the requirements of the City of Los Angeles, and must include a construction phasing component. The design of traffic controls is to address traffic needs at the intersection of Etiwanda Avenue and Plummer Street, and must include the addition of a traffic signal. The visibility of this signal must be analyzed and include pedestrian overpass visibility, as well as include traffic signs and striping necessary for the safe flow of traffic around the green space.

The students are required to address any design issue that may be impacted by the construction of this space. This includes all connections to city facilities as well as upgrading existing facilities where they are impacted.





Construction Management Program

CSUN Recreation Center

Amine Ghanem
Faculty Advisor

Students
Tommy Criner, Michael Elliot, Sammy Jouglet, Matt Reeves, and Laurie Shneider

Jason Bacon, Khatchik Barsikhian, Ara Gregorian, Sebouh Ohanessian, Shant Printzian, and Mark Spiridon

The CSUN Recreation Center is a capstone project spanning over two consecutive semesters where the students demonstrate their ability to apply the concepts taught in the construction management technology program. This year their project consists of preparing the bid documents for the new CSUN Recreational Center.

ELECTRICAL & COMPUTER ENGINEERING

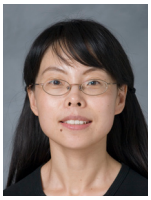
Software Defined Radio

James Flynn, Sharlene Katz, and David Schwartz
Faculty Advisors

Students:
Brian Meadows, Charles Judah, Ryan Rawson, Michael Berman, Derrick Jones, David Alvarez, Jack Sun, Silvestre Sanchez, Kinal Vachhani, Kaveh Hajimohammadreza, Youssef Chedid, Efrain Mendoza, Travis Janssen, Carlos Figueroa, and Banafsheh Tehranchi

The Software Defined Radio (SDR) Senior Design Project exposes CSUN students to a new, cutting edge technology while immersing them in a complete, real world engineering experience. Made possible by funding from Edwards Air Force Base, the SDR project challenges seniors to develop complete systems to solve complex problems similar to those facing military and commercial interests today. In the past year groups developed a complete telemetry communications link to be used on an Unmanned Aerial\Vehicle (UAV) and an All-Mode High Frequency Amateur Radio Transceiver. Both groups used SDR to create practical systems that perform to demanding specifications, taking the systems from concept through testing. As part of their experience, the groups functioned as multi-disciplinary teams, involving many of the specializations within electrical and computer engineering. CSUN faculty created an environment simulating a real world engineering project. Limitations on cost, resources, and time were strictly imposed, requiring students to think as engineers. Students honed their communications skills with weekly oral reports and written documentation. In addition, students learned to manage their projects with time charts and deadlines. This year's teams are building on this work with the development of target recognition systems and physical miniaturization of the systems into field programmable gate arrays (FPGAs).

Unmanned Aerial Vehicles



Xiaojun (Ashley) Geng
Faculty Advisor

Students
Michael O. Yeretzian, Aditya Singh, Long Nguyen, Miguel A. Urrea, Ellison M. Yasukochi, Alex Standridge, and Andy Purcell

This project aims at designing an air-borne vehicular system with adequate capabilities to accomplish the mission set by the AUVSI International Aerial Robotics Competition. The aerial vehicle needs to be fully autonomous, capable of self controlled flight within a confined environment. According to the competition, "The vehicle will first be required to enter a building through a one square meter opening from a designated launch area 3 meters away. Then, it needs to search for a target area while avoiding unbriefed obstacles such as walls, columns, and furniture, as well as visible security systems including a scanning video camera located just outside the window entry and a laser barrier in a hallway which denies detection-free access to various offices unless manually disarmed." The project work consists of the following subtasks: aerial platform design, flight control, localization, positioning, vision recognition, and communications with JAUS protocol.

COMPUTER SCIENCE

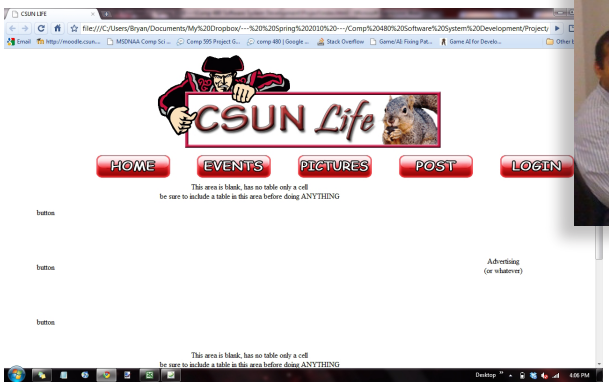
CSUN-LIFE.COM For the development and sharing of social and entertainment ideas

Robert Lingard
Faculty Advisor

Students

Sunil Gahlawat, Bryan Harrington, Talha Majeed, Radhika Malhotra, Eliud Munguia, and Negin Parya

CSUN-Life.com is a user driven web page designed for students to interact and share their off campus experiences with each other.



iPhone Campus Direction Guide

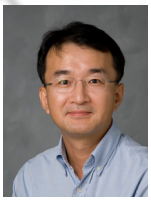
Robert Lingard
Faculty Advisor

Students

Ian Fujimoto-Morgan, Mike Lin, Andrew Miley, and Arie Salma

The main purpose of the application is to locate campus buildings with reference to the user's location providing the user a real-time compass heading and distance to the desired location.

Word Search Generator

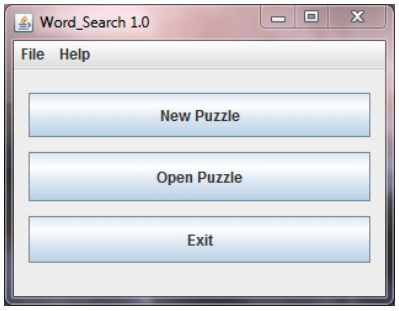


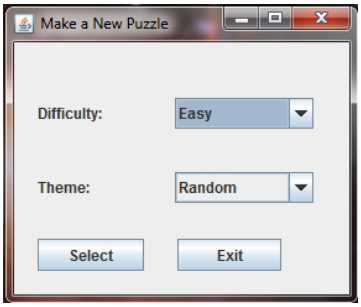
George Wang
Faculty Advisor

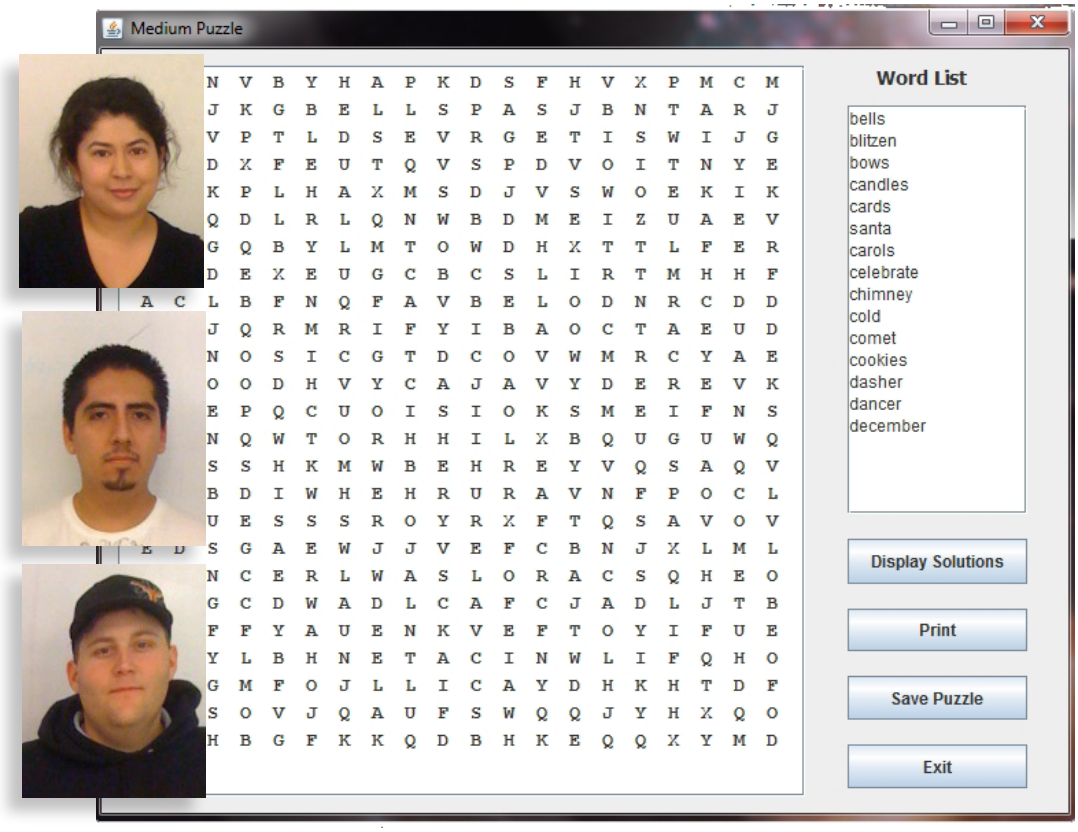
Students

Bryan Harrington, Eliud Mungia, and Milagro Medrano

This project is a Java based application that generates random word search puzzles based on user input. Users can specify what type of theme and difficulty they want to generate. After generating a puzzle, users can then print their puzzle and display its solution.

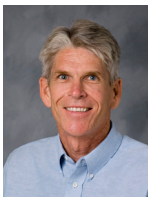






MANUFACTURING SYSTEMS ENGINEERING & MANAGEMENT

Grape Seed Oil Extractor

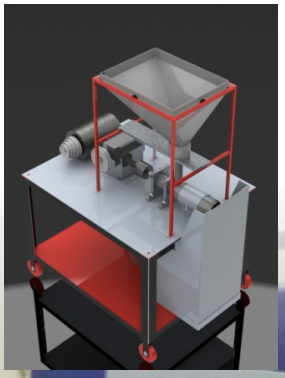


Robert D. Conner
Faculty Advisor

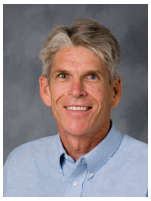
Students
Braulio Diaz, Edgar Giron, Jr., Nathan Kroener, Derrick Olsen, and Jesus Rives

The CSUN MSE senior design project and entry into the Westec design competition is a working prototype of a screw type oil extraction press. The application of the seed oil press is to extract the oil from grape seeds. Currently, the oil is extracted by chemical methods. The seed oil press is designed in a simplified and universal manner in which key components are interchanged for differences in seed size. Small to medium size vineyards may use it to increase their profits by extracting grape seed oil from the grape seeds that would otherwise just be used for fertilizer. Additional potential markets for grape seed oil include health products, cooking products, and skin care products.

The screw extraction seed oil press prototype is built using aluminum, 1018 steel and 302 stainless steel. The bearing tube is made from 1018 steel and houses two sleeve bearings which align with a power input shaft. The bearing tube also acts as the rear support for a thrust bearing that takes the axial load generated by the compression of the grape seeds. The screw, which feeds and compresses the grape seeds, is machined from stainless steel. The seed oil is expelled from .15" diameter holes drilled perpendicular to the surface of the steel compression tube. The end cap holds the tip insert that has an internal taper which may be altered depending on the seed size. The mulch is extruded through the end cap's center hole. Both the end cap and tip insert are made from steel. A final production model will be fabricated entirely from 304 stainless steel.



CSUN CNC Tool Cart

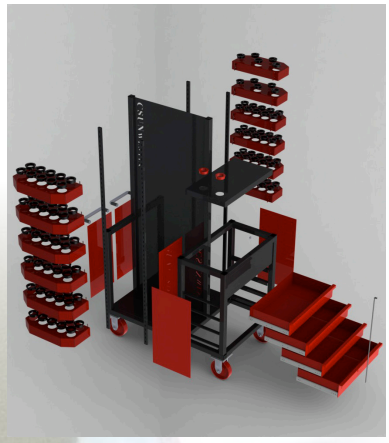


Robert D. Conner
Faculty Advisor

Students
Fawaz Alsugair, Rigo Casas, Tuan Dinh, Kevin Jamir, and Stewart Stachowiak

The CSUN MSE Senior Design entry for the SME Westec design competition is a CNC Tool Cart. This cart is intended for any CNC machine shop to efficiently and effectively house tool holders. Mobile tool carts are limited in the number of tool holders they can carry. The CSUN CNC Tool Cart was designed to achieve maximum mobility while having a small footprint and the ability to accommodate up to one hundred forty tool holders along with a fixed toolbox. The CSUN CNC Tool Cart was created in four phases that included the frame, walls and rack, trays, and toolbox.

The frame, the first component of the design that was completed, was made of TIG welded 1.5" square 1018 steel tubing. This material provides high strength along with a compact rigid design. The side walls of the CNC Tool Cart were made from 14-gauge steel sheet metal and bolted to the frame using L-brackets made from the same material. The vertical rack was made using 10-gauge steel sheet metal which was welded to the frame along with the four slotted bars to support the tool trays. All fourteen trays were made of 14-gauge steel sheet metal and designed to hold up to ten tool holders. The hooks on the trays allow adjustment to any desired height on the slotted bars. A fixed toolbox was added to the tool cart to hold additional hand tools. Made up of 12-gauge steel sheet metal, the toolbox provides four drawers and a locking feature.



MECHANICAL ENGINEERING

Innovative Design & Development of NorMAN Jr., an Intelligent Ground Vehicle

C. T. Lin
Faculty Advisor

Students

Presenters: Hector Perez, Travis Baluyot, Mario Servin, Craig Euler, Garrett Leonard, and Joey Horvath

Team: Raul Alvarez, Travis Baluyot, Adrian Candelario, Pei-Chun Chen, Craig Euler, Joseph Horvath, Mike Huerta, Rome Kenmepol, Garrett Leonard, Sevag Matavosian, Ara Mekhtarian, Cameron Mills, Hector Perez, Joseph Portillo, David Prince, Jeffrey Schroeder, Mario Servin, Michael Stefun, Po-Jeg Wang, and Daniel Weissberger

The Intelligent Ground Vehicle consists of a differential drive robot whose purpose is to autonomously navigate through an obstacle course. Innovations such as switchable power, hybrid power system, power monitoring system, generator power trailer system, vector polar histogram cognition/motion control, vision, and navigation improvements have been implemented. The switchable power module has decreased test downtime by allowing the user to quickly switch out lithium polymer batteries/hydrogen tanks when low, from the fuel cell hybrid battery power system, to another source. The DAQ system allows the user to monitor current and voltage, as well as hydrogen tank pressures. The hybrid power system has increased vehicle runtime from 2 to 4 hrs, while decreasing weight by 8lbs. The navigation program features a goal priority setting algorithm which finds the fastest path through a set of GPS waypoints. Cognition is based on an obstacle avoidance algorithm known as vector polar histogram (VPH) whose main function is to avoid directions leading to an obstacle closer to the robot than its neighboring obstacles. Vehicle motion is improved by fine tuning control gains governing its response. The vision system is able to determine where the boundaries of a path are to stay within the desired path.

Human Powered Vehicle

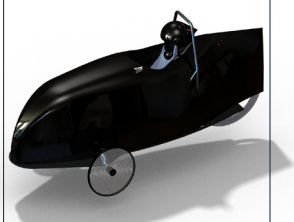
Robert G. Ryan
Faculty Advisor

Students

Presenter: Jonathan Incorvaia
Team: Jonathan Incorvaia, Ararat Arakelian, Jesse Cordero, Riocard Delos Santos, Reynaldo Evangelista, Ricardo Garcia, Jonathanmarc Abanico, Lior Inberg, John Lake, Mitesh Mistry, Sepideh Norouzi, Raymond Palomino, Maurycy Sarosiek, Michael Studer, David Walker, Behnam Ansari, Boozarjomehr Behzadian, Bruce Rivera, Daniel Sarfati, and Bryan Zubiate

The American Society of Mechanical Engineers (ASME) sponsors the annual Human Powered Vehicle Challenge (HPVC) to provide an opportunity for undergraduate engineering students to demonstrate the application of sound engineering design principles in the development of sustainable and practical transportation alternatives. In the HPVC, students work in teams to design and build efficient, highly engineered vehicles which are practical for everyday use but also demonstrate superior performance. While speed is an important factor, this competition assigns greater value to the elegance and ingenuity of the design, including presentation, practicality, safety, and functionality. Competitors are judged based on a comprehensive design report and vehicle performance in speed and endurance events. This year's CSUN entry is designed around a composite "belly pan" and has three wheels for safety and stability. A full carbon fiber fairing is attached to minimize aerodynamic drag and increase top speed.

Vehicle without fairing



Vehicle with fairing

Formula SAE Vehicle

George Youssef
Faculty Advisor

Students

Presenters: Brian Benton, Sam Anderson, Henry Cespedes, Jae Hong & Marcus Gottschalk
Team: Eric Acuna, Meshari Alenezi, Samuel Anderson, Jorge Arteaga, Brian Benton, Henry Cespedes, Gustavo Da Silva Ramos, Morris De La Roca, Guillaume Etienne, Marcus Gottschalk, Eduardo Hernandez, Jae Hong, Paula Kamel, Voltaire Lebron, Scott Linton, Robert McAfee, Brian Moore, Barry Orr, Dimtry Tsyvulevsky, and David Weisbach

The Formula SAE (FSAE) is an annual competition held by the Society of Automotive Engineers. The concept of the competition is to create a fictional manufacturing firm that has appointed a design team, Matador Motorsports, to produce a prototype racecar. Students are required to conceive, design, and build a formula style racecar to compete each year against other universities from around the world. The FSAE is a project that requires the skills and theory learned from the mechanical engineering curriculum. Two parts of the curriculum are emphasized: theory and laboratory work. Students work with the state-of-art equipment that manufactures the components they have designed. 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 engineering industry. Restrictions are placed on the design of the car in order to test the student's ingenuity for maximizing the vehicles 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 considerations.

Solar Powered Autonomous Aircraft for Aerial Observation

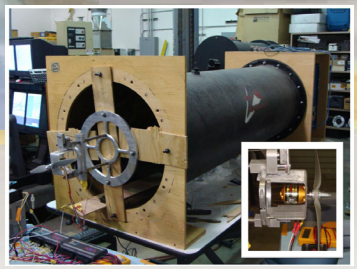
Tim Fox
Faculty Advisor

Students

Presenters: Israel Cardenas and Andrew Sawin
Team: Hamid Askarisobi, Tigran Avakyan, David Bechara, Jeff Bunting, Israel Cardenas, Carlos Cordova, Tomasz Dykier, Reynaldo Evangelista, Andrew Gabler, Jose Gutierrez, Levon Gevorkyan, Gabriel Guillen, Robert Hoffman, Daniel Johnson, Hayata Kamijo, Juan Mendoza, Jaime Moran, Brian Nakamura, William Orellana, Salvador Rodriguez, Michael Salem, Andrew Sawin, Shane Ware, Duy Vu, and Anthony Yonano

An ultra-lite, composite aircraft with an 8 foot wingspan has been developed for remotely monitored, autonomous aerial observation. Powered with an electric motor/propeller combination in a pusher configuration, it has an extended operational flight time of 8 hours with its LiPo battery - GaAs solar power subsystem. An autopilot enables flying pre-programmed routes, which can be modified in flight from the ground control station. Real time, multi-view video provides aerial observation at the ground control-command station. Gimbaled video cameras enable characterization of ground objects and determination of the object's GPS coordinates.

Design, development, fabrication and flight demonstration was an interdisciplinary, multi-year effort, incorporating students emphasizing Aerospace, Mechanical, and Electrical Engineering along with graduate students from the Human Factors program in the Psychology department. The project incorporated material from virtually every required course in the Mechanical Engineering program, as well as several senior/graduate electives.



Thank you!

Projects Showcase Judges

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

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

Jack Coe
Principal Consultant (Retired)
Boyle Engineering Corporation
College Industrial Advisory Board
Civil Engineering & Applied Mechanics Liaison Council

David J. Drapeau
Section Head
Solid State Microwave, Microwave Center
Raytheon, Electronic Systems
Electrical and Computer Engineering Liaison Council

Chris M. Erickson
Program Chief Engineer
Attitude Control Propulsion Systems
Pratt & Whitney Rocketdyne
College Industrial Advisory Board

Michael A. Gross
Assistant Division Manager
Flight Projects Autonomous Systems Division (34)
Jet Propulsion Laboratory
College Industrial Advisory Board

David Honda
President
D.S. Honda Construction
Construction Management Technology Liaison Council

William Munsch
Pratt & Whitney Rocketdyne
Mechanical Engineering Liaison Council

Vadim Parizher
Director, Information Systems
Amgen
Computer Science Liaison Council

Felix Rabinovich
Amgen
College Industrial Advisory Board

Carlos Rodriguez
Department of Transportation
City of Los Angeles
Manufacturing Systems Engineering & Management Liaison Council

William Saltenberger
Executive Vice President
Construction & Project Management
Westfield LLC
Construction Management Technology Liaison Council

Don Sepulveda
Senior Railroad Engineer
West Division
HNTB
Civil Engineering & Applied Mechanics Liaison Council

Perry Solomon
President & CEO
Aleratec
College Industrial Advisory Board

Faculty Judges

Nazaret Dermendjian
Civil Engineering & Applied Mechanics, Associate Chair

Mohamed Hegab
Construction Management Technology Professor

Nhut Ho
Mechanical Engineering Professor

John Motil
Computer Science Professor

Ben Mallard
Electrical & Computer Engineering Professor

Bruno Osorno
Electrical & Computer Engineering Professor
Honors Co-Op Academic Director

Mark Rajai
Manufacturing Systems Engineering & Management Professor

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Principal Consultant (retired)
Boyle Engineering Corp.

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Engineering Director, Palmdale Site
Lockheed Martin Aeronautics Company

RORY DEJOHN
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General Manager
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Attitude Control Propulsion Systems
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LOUIS W. HEBERT
Strategic Planner
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Intel Corporation

THERESA JESTER
Sr. Director, Solar America Initiative
SunPower Corporation

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

CAROLE MORTON
President
Salt Interprises

PEGGY NELSON
Vice President &
Advanced Missions Program Manager
National Systems Business Area
Northrop Grumman Corporation
Aerospace Systems Sector
Space Systems Division

KALATHUR PATTABIRAMAN
Global Materials Engineering Manager
Honeywell TurboTechnologies

GERALD PICUS
Consulting Engineer

FELIX RABINOVICH
Amgen

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

ABE REICHENTHAL
President and CEO
3D Systems Corporation

DUTCH SCHULTZ
Director of Network Engineering & Planning
Western United States
Verizon

RONALD SMILEY
Avionics Director & EW/
Combat Systems Director
Naval Air Warfare Center Weapons Division

PERRY SOLOMON
President & CEO
Aleratec, Inc.

MICHAEL TOVAR
Engineering Design Group
Western States Business Unit Manager
CH2M Hill

KEN VARNELL
Manager of Engineering
Southern California Edison

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

MARILEE WHEATON
General Manager,
Systems Engineering Division
The Aerospace Corporation

JOHN WRIGHT
Design Center Manager
Engineering Department
ITT Corporation - Force Protection Systems

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http://www.csun.edu/ecs

California State University
Northridge

18111 Nordhoff St., Northridge, Ca. 91330
Information (818) 677-1200
Public Safety 677-2111 · *www.csun.edu*

Parking is available in Parking Lot G3.

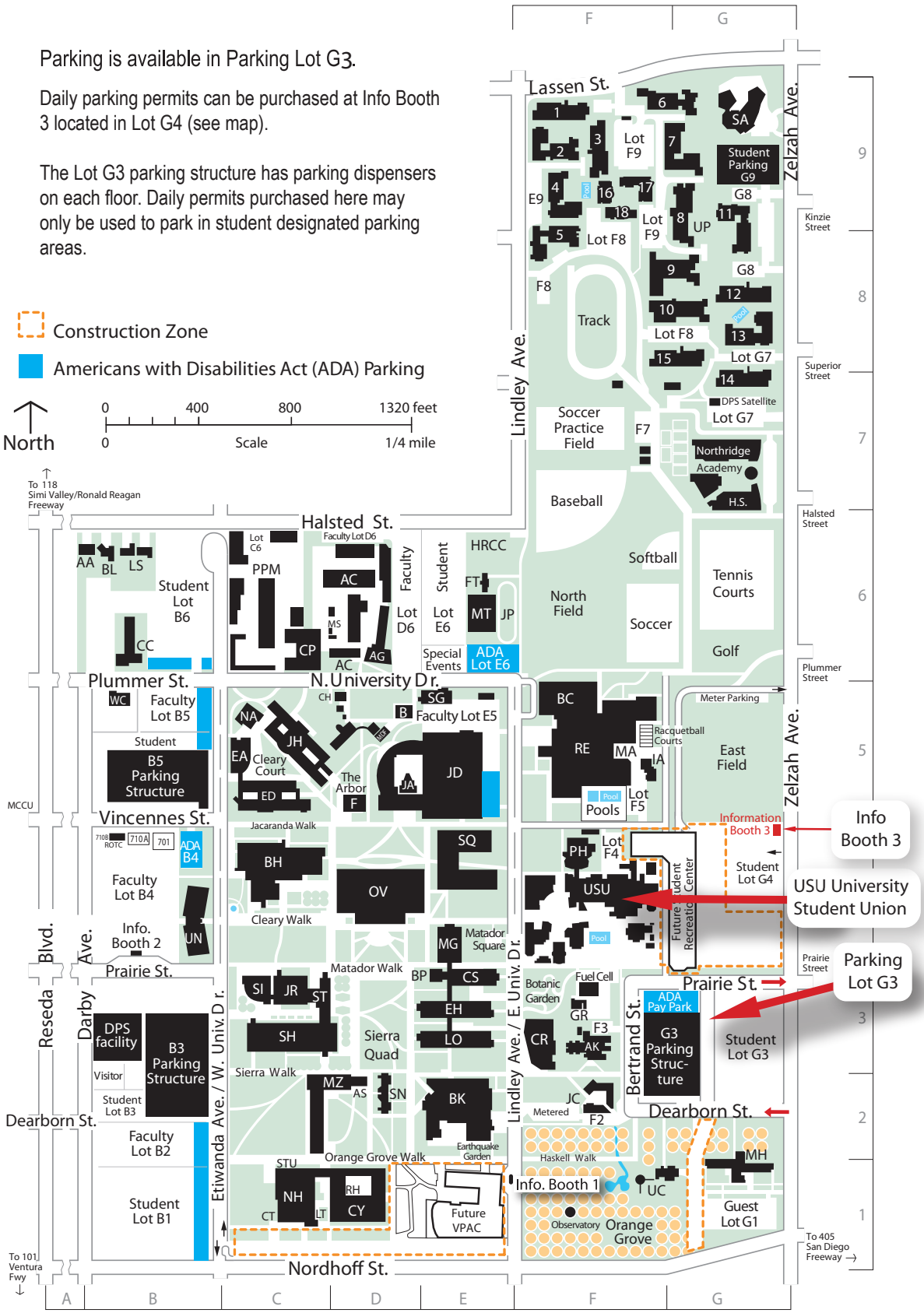
Daily parking permits can be purchased at Info Booth 3 located in Lot G4 (see map).

The Lot G3 parking structure has parking dispensers on each floor. Daily permits purchased here may only be used to park in student designated parking areas.

Construction Zone

Americans with Disabilities Act (ADA) Parking

North 0 400 800 1320 feet
Scale 0 1/4 mile



DIRECTIONS

Via the San Diego Freeway (405):

Heading north: Exit at Nordhoff St.
Left on Nordhoff to Zelzah Ave.
Right on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Heading south: Exit at Nordhoff St.
Right on Nordhoff to Zelzah Ave.
Right on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Via the Ventura Freeway (101):

Heading west: Exit at Reseda Blvd.
Right on Reseda to Nordhoff St.
Right on Nordhoff to Zelzah Ave.
Left on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Heading east: Exit at Reseda Blvd.
Left on Reseda to Nordhoff St.
Right on Nordhoff to Zelzah Ave.
Left on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Via Ronald Reagan Freeway (118):

Heading west: Exit at Reseda Blvd.
Right on Rinaldi St. to Reseda.
Right on Reseda to Nordhoff St.
Left on Nordhoff to Zelzah Ave.
Left on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Heading east: Exit at Reseda Blvd.
Right on Reseda to Nordhoff St.
Left on Nordhoff to Zelzah Ave.
Left on Zelzah to Dearborn St.
Left on Dearborn to Lot G3

Cartography: Randal Scot Thomson x2127
Public Relations and Strategic Communications

July 15, 2009

UNIVERSITY STUDENT UNION