

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 8:30 - 9:00 a.m.

Title: Jeffreys Horizon Ridge Park

Department of: Civil & Environmental Engineering

Project Participants: Godwin Agbleze, Dominique Hollis, and Miguel Marin

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Mr. Albert Jankowiak

Faculty Advisor: Dr. Sajjad Ahmad

Abstract:

This project involves the development of a recreational park on an 11.23 acre site. The site is located at the northeast corner of Jeffreys Street and Horizon Ridge Parkway in Henderson.. In addition to designing the park, we prepared a drainage study and construction plans for the drainage conveyance system. We utilized engineering computer applications such as AutoCAD and FlowMaster to finalize our design plans.

The purpose of this project is to create a family-friendly environment for the citizens of the City of Henderson. The development of this park will decrease the strain on other parks in the city and enhance the aesthetics of Jeffreys Street and Horizon Ridge Parkway.

Notes: _____



From left to right: Godwin Agbleze, Dominique Hollis, and Miguel Marin



Future Site of Jeffreys-Horizon Ridge Park

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 8:45 - 9:15 a.m.

Title: Voice Recognition Remote Control

Department of: Electrical & Computer Engineering

Project Participants: Yevgeniy Aronov

Instructor: Dr. Paolo Ginobbi

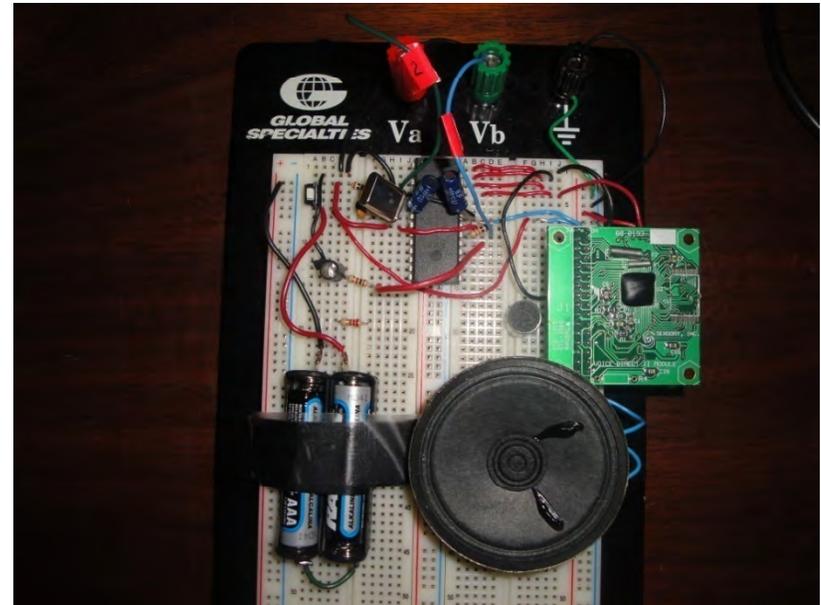
Abstract:

The project that I am working on is a Voice Recognition TV Remote Control. I've had this idea for a long time, when watching a television I always wanted to create a remote control that would work with voice commands.

The TV remote controls out today are push buttons and even though that is convenient, but it's still gives us an inconvenience when remote control is misplaced. Therefore, the idea of a voice activated remote control sounded interesting to me. I have decided to design this device.

My idea is to be able to turn television on and off, change the channels and control the volume by just speaking to the unit device that I will build. This idea can also be taken to a different level incorporating the voice activated unit for locking and unlocking vehicles.

Notes:



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 9:00 - 9:30 a.m.

Title: Conveyance of Ground Water from Northern Nevada to the Las Vegas Valley

Department of: Civil & Environmental Engineering

Project Participants: Theresa Bray, Regina Dennis, Crystina Gonzalez, and Monika Hagood

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Mr. Gregory Kodweis

Faculty Advisor: Dr. Jacimaria Batista

Abstract:

Water resources are limited in Southern Nevada. Las Vegas Valley has a maximum allocation from the Colorado River that meets current water demand. However, future population predictions indicate that additional water sources must be developed to meet future demands. The Southern Nevada Water Authority (SNWA) is considering several options to expand its water resources including building desalination plants in California, water banking in Arizona, and bringing groundwater from northern Nevada counties.

This project evaluates design options for conveying 90,000 acre-ft/year of groundwater to Las Vegas from five northern Nevada basins in White Pine and Lincoln Counties. Water quality analysis of the wells indicates the water is of good quality, but several wells have arsenic levels that exceed EPA drinking water standards.

Our project includes design of 246 miles of 72" diameter pipeline to convey water from the northern counties to Las Vegas, four pumping stations consisting of four pumps each at 3000 hp and 900 rpm, and pressure equalization tanks to maintain the integrity of the network. In addition, the system includes onsite ion-exchange treatment units and a centralized coagulation system to remove arsenic from the water and four underground concrete tanks for water storage.

Notes: _____



Regina Dennis, Monika Hagood,
Crystina Gonzalez, and Theresa Bray



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 9:15 - 9:45 a.m.

Title: Battery Monitor for Generic Battery Systems

Department of: Electrical & Computer Engineering

Project Participants: Benjamin Mitchell

Instructor: Dr. Paolo Ginobbi

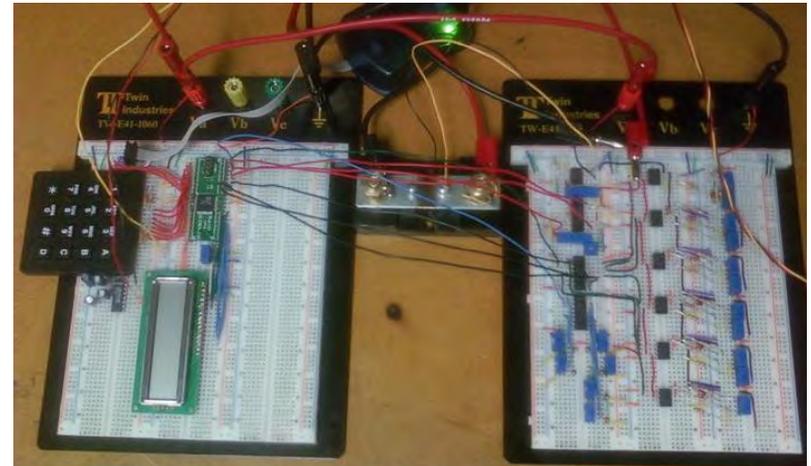
Faculty Advisor: Dr. Yingtao Jiang

Abstract:

Advances in electric drive systems and battery technologies have increased the feasibility of developing Electric and Hybrid Vehicles. The diversity in power controllers and battery chemistries are allowing for a wide selection in design and implementation. A majority of the required components are off the shelf products with the exception of the battery monitor and capacity gauge.

This vital component requires calibration for every battery chemistry and configuration. Major auto makers have the resources to develop simple modules for testing and a final monitor for production, but have to adjust for every variation. Grassroots efforts have little to no choice but to spend more resources in development with little room for error.

My design incorporates a wide spectrum of algorithms necessary to accurately depict battery capacity and red flag conditions for a range of different battery voltages and chemistries. The monitoring system adapts to changes in power capacity due to cycle life and environmental conditions, and its interchangeability with multiple designs and applications allows for several degrees of freedom for final product design. The accuracy of this design allows it to be further developed with minor modifications to programming to suit the needs of final product implementation and mass production.



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Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 9:30 - 10:00 a.m.

Title: Dual Axis Solar Tracker

Department of: Mechanical Engineering

Project Participants: Leonardo Banchik, Stanton Byington, and
Jonathan Realmuto

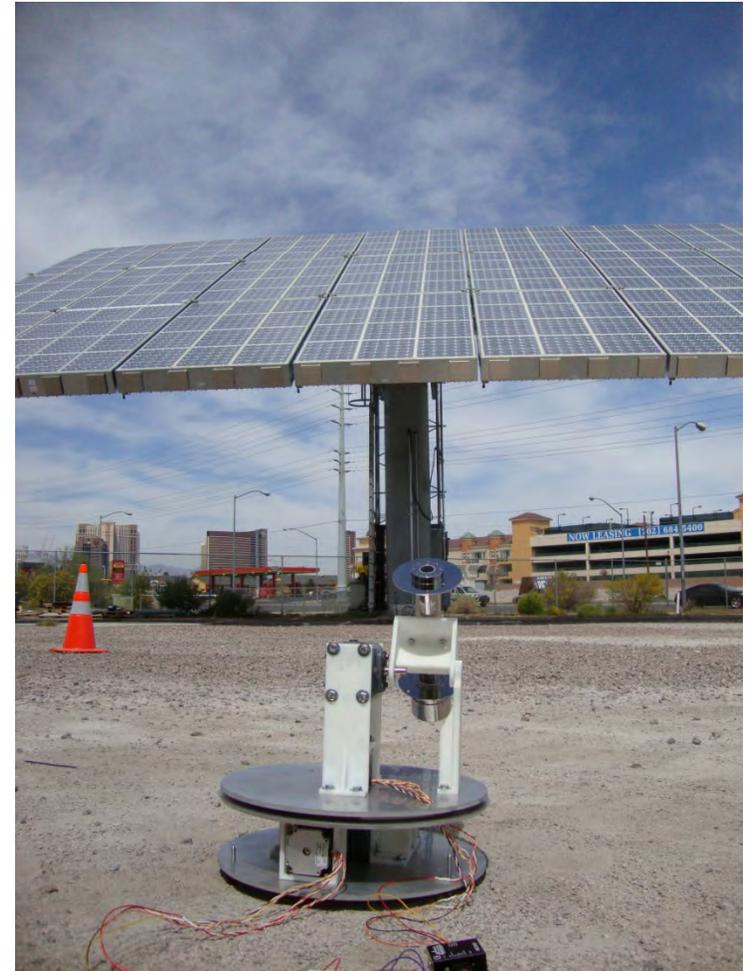
Instructor: Dr. John Wang

Abstract:

The ability to track the sun is a fundamental requirement for many mechanical systems in the solar industry. Some solar power generators perform better when tracking the sun on two axes while for others it is essential that less than one-degree accuracies be reached for proper functioning. Other applications for dual axis tracking include the use of solar instrumentation which require direct incident sunlight, such as the Eppley labs Normal Incidence Pyrheliometer (NIP).

Although dual-axis trackers are commercially available, they are expensive and are not user friendly. Some cannot be operated for more than a 24 hour period without readjustment. To supply the demand for these trackers the team has built a dual axis tracker that is highly accurate (within less than 0.1°), robust (can operate continuously without readjustment and placed anywhere internationally), and highly affordable (less than \$2,000). The tracker uses two stepper motors in parallel to drive the unit along the azimuth and zenith angles. The motors are controlled by an XMOS microchip that executes Ephemeris equations which describe the angular position of the sun. A GPS chip is interfaced with the microchip and provides the location and time data required to execute the equations. To compare the accuracies between the team's tracker and a commercial one, NIPs were installed on both and the readings compared.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 9:45 - 10:15 a.m.

Title: H₂O No-Flow

Department of: Mechanical Engineering

Project Participants: John Harden, Robert Saylor, and Robert Stout

Instructor: Dr. John Wang

Faculty Advisor: Dr. Yi'Tung Chen

Community Mentor: Mr. Rick Darnold

Abstract:

Due to limited fresh water supply, prevention of water waste has become a national issue. Every day, large quantities of water are wasted on miniature Bellagio water shows in household front lawns as a result of broken sprinklers. Not only do increased water bills and dead grass pose a dilemma to consumers, the problem has gained such gravity that water supply companies have begun instituting fines for unintended geysers on lawns (especially in drought ridden communities such as southern Nevada).

The goal of H₂O No-Flow is to develop a practical solution that prevents the manifestation of lawn geysers at an economically feasible level to the consumer. The product designed by the H₂O No-Flow team instantaneously seals off water flow once a sprinkler or riser is broken without impeding flow to a functional sprinkler. The design reliably operates without the need to incorporate any means of electronics, sensors, or computers which results in the desired low price consumer solution. In essence, the system prevents water waste in household lawns and encourages homeowners towards a cost-effective green future.

Notes: _____



From left to right are Robert Saylor, Robert Stout, and John Harden

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 10:00 - 10:30 a.m.

Title: Arroyo Grande Sports Complex Rejuvenation

Department of: Civil & Environmental Engineering

Project Participants: Jonathan Bailey, Christine Glembin, Jamie Pearce, and Sophia Peressini

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Mr. Scott Fiedler

Faculty Advisor: Mr. Kenneth Lamb

Abstract:

Arroyo Grande Sports Complex is located on the southeast corner of Arroyo Grande Boulevard and Santiago Drive in Henderson, Nevada. For many years, the Complex was nationally known as one of the best ball-field sites in the nation.

However, the quality of both the fields and facilities has become dilapidated due to inadequate pedestrian flow, use of improper materials, and high ground water. The existing sixty-acre sports complex includes four softball fields, one senior baseball field, four junior baseball fields, a basketball court, barbeque pits, and several areas for play and other activities. Additionally, an undeveloped ten-acre area serves as a detention basin for the Pittman Wash during infrequent but very high volume floods. A site analysis was conducted in 2008 to analyze, identify, and make recommendations for improvements to the park. It was through the preferred alternative suggested by the site analysis that the City of Henderson, in conjunction with the community, drafted a master plan.

BPPG took on this project in order to design the redevelopment of this diverse park in conformance with the approved Arroyo Grande Park Master Plan. Our team will also strive to make Arroyo Grande Sports Complex as sustainable and self-reliant as possible. BPPG's purpose is to design an exemplar park of the twenty-first century. During tough economic times and a global energy crisis, Arroyo Grande Sports Complex can be a template for other recreational and industrial sites.

Notes: _____



BPPG Engineering Team Photo

From Left to Right: Jonathan Bailey, Jamie Pearce, Sophia Peressini, and Christine Glembin



Arroyo Grande Sports Complex Master Plan

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 10:15 - 10:45 a.m.

Title: Wastewater Treatment and Reuse for Aliante

Department of: Civil & Environmental Engineering

Project Participants: Danielle Cotte, Mark Elkouz, Carlos Garcia, Kathryn Leonardo, and Adam Wirthlin

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Ms. Anita Marquez

Faculty Advisor: Dr. Jacimaria Batista

Abstract:

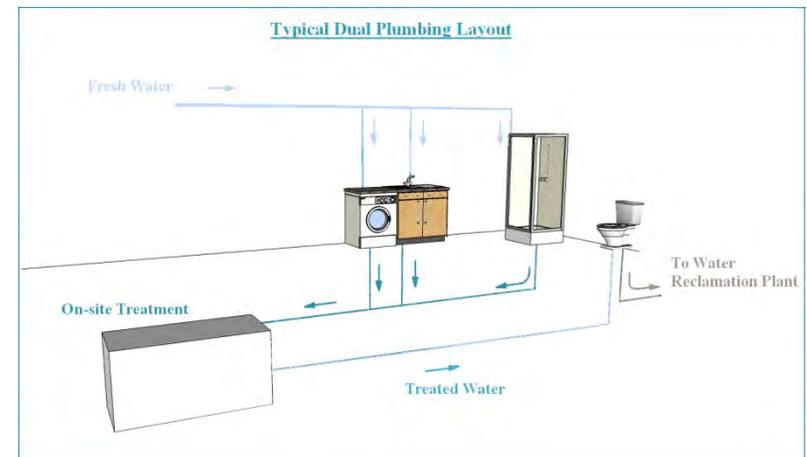
In recent years, Southern Nevada has been concerned with the decreasing water levels in Lake Mead. During this time, the Southern Nevada Water Authority (SNWA) implemented a number of measures designed to ensure that the Valley does not run out of water before a more permanent solution is found. With this severe problem in mind, this design team devised a plan to assist SNWA in their water conservation effort while simultaneously addressing the worldwide concern for sustainability through wastewater treatment and reuse. The purpose of this project is to design a water reclamation plant and a dual plumbing system with an on-site treatment facility for a proposed hospital in the Aliante area of North Las Vegas. The dual plumbing system directs water from sinks, showers, and laundry facilities to the small on-site treatment facility. The treated water is routed back through the hospital to service toilets. The wastewater is then sent to the sewer for subsequent treatment at the new Aliante water reclamation plant.

Reclaimed water from Las Vegas is sent to Lake Mead and then pumped back to Las Vegas, a distance of 28 miles with an elevation rise of 1,100 feet, using a large amount of energy and releasing carbon dioxide into the atmosphere. This project's main objective is to observe the economic and environmental impacts that a dual plumbing system could have if widely used in Southern Nevada. Expected outcomes include lower energy use, water consumption savings and a reduction of carbon dioxide emissions, as well as the use of newer technologies to improve water usage, and achieve a more sustainable lifestyle.

Notes: _____



Pictured left to right: Adam Wirthlin, Kathryn Leonardo, Carlos Garcia, Danielle Cotte and Mark Elkouz



Layout of a Typical Dual Plumbing System: A comparable Layout has been designed for a proposed Aliante hospital and could provide dramatic energy savings.

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 10:30 - 11:00 a.m.

Title: Multicolor LED Photography Flash

Department of: Electrical & Computer Engineering

Project Participants: Brian Lu and Carlos Zepeda-Matal

Instructor & Faculty Advisor: Dr. Paolo Ginobbi

Abstract:

The idea behind this project is to replace the color correction film and computer software currently used by photographers to achieve a desired color effect in their pictures. The color correction film is inconvenient to use, the user has to change the color temperature by replacing the film in front of the strobe flash. The computer software takes time to learn and to process, which also decreases the picture quality.

Our project is to design and build an LED Photography Flash capable of changing the color of the light emitted, in order to match with the surrounding color temperature of the object the camera is pointing at and be able to manipulate color effects in pictures. The flash will be triggered by the same mechanism that triggers a photographic digital camera. The user would be able to choose the desired color using a knob within a color scale.

The LEDs used in our project are called RGB LED, because each single RGB LED contains three different color LEDs inside of the dome: Red, Blue and Green. By mixing the intensity of the three colors, we can obtain a large color spectrum. We use Pulse Width Modulation (PWM) to control the intensity of the colors. Our 7x7 inches LED panel contains 96 RGB LEDs and 18 constant current LED drivers. To make it portable, we use a 3.5 AH lead acid battery for our power source. For generating and controlling of the PWM signal, we use the ATmega328 microcontroller. Our multicolor LED photography flash has the advantage of portability, ease to use, more shots per battery charge, and the freedom of change to any color the user desires.

Notes: _____

Photo
Not
Available

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 10:45 - 11:15 a.m.

Title: Ghana Orphanage Project

Department of: Civil & Environmental Engineering

Project Participants: Steven Conner, Sean Robinson, and Weijian Zhang

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Ms. Mama Elise

Faculty Advisor: Dr. Aly Said

Abstract:

Children are great imitators. So give them something great to imitate. This is the philosophy that Engineering Without Borders and PourDesign have adopted in response to a proposal to improve the lives of 40 orphaned children located in Tsito, Ghana in Africa. The Ghana Orphanage Project is to be completed in three phases, the second of which is the structural design of the orphanage, which is to be built June 2010.

PourDesign has planned and designed two separate single story buildings in accordance with all current international building codes. The use of innovative “bamcrete” (reinforced bamboo concrete) enabled PourDesign to develop an imaginative design that utilizes local renewable resources in constructing the buildings. Sustainable developments are the cornerstones of PourDesign’s practice. The collaborative efforts of clients, architects, and engineers along with the use of bamcrete has resulted in a project with increased efficiency and decreased costs. The design of the Ghana Orphanage Project provides necessary shelter for orphans while advancing and inspiring others that structural design does not have to be sacrificed even in the face of tough economic conditions.

Notes: _____



**Conceptualized illustration of Tsito, Ghana Orphanage:
structure side angle view**



**PourDesign members (*pictured left to right*):
Weijian (Ken) Zhang, Sean Robinson, Steve Conner**

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 11:00 - 11:30 a.m.

Title: The Scubba Caddy

Department of: Mechanical Engineering

Project Participants: Yonas S. Cherkos, Sean W. Daly, Sean M. Jackson,
and Sylvester L. Vargas

Instructor: Dr. John Wang

Faculty Advisor: Dr. Mohamed Trabia

Abstract:

Scuba divers have always had the burden of carrying their scuba tanks when they go diving, and this burden has often resulted in divers searching for the nearest wheelbarrow or cart to help them with this task. While these items are not always to be found, and are often unreliable if found, they are quite large and heavy and have to be brought back to the dock for others to use. The Scuba Caddy provides an easy solution to these problems. The Scuba Caddy controls like a normal dolly, but is designed to accommodate up to two scuba tanks safely. The Scuba Caddy is also lightweight and compactable, so it can be stored in a boat or car with ease.

The Scuba Caddy's features include a telescoping handle, a folding base plate which fits flush against the frame, all aluminum and stainless steel metal to protect against corrosion, a cushioned upper support to help prevent damage to the tanks, bungee straps for each tank to ensure safety and stability, diamond base plate to reduce slipping/movement of tanks due to water, and protruding rings on the base plate that fit comfortably around the boot of scuba tanks for added stability. All of this comes to a total of 20 pounds to allow for portability and ease of use.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 11:15 - 11:45 a.m.

Title: (A.R.T.) Autonomous Refuse Transporter

Department of: Interdisciplinary – Mechanical Engineering / Electrical & Computer Engineering

Project Participants: Freddy Dorantes, Ronald Lorick, Lucretia Martin, Zachary Mellinger, Marissa Takata, and Vernon Wells

Instructors: Dr. Paolo Ginobbi and Dr. John Wang

Client Advisor: Dr. Daniel Cook

Faculty Advisors: Dr. Shahram Latifi and , Dr. Brian J. Landsberger

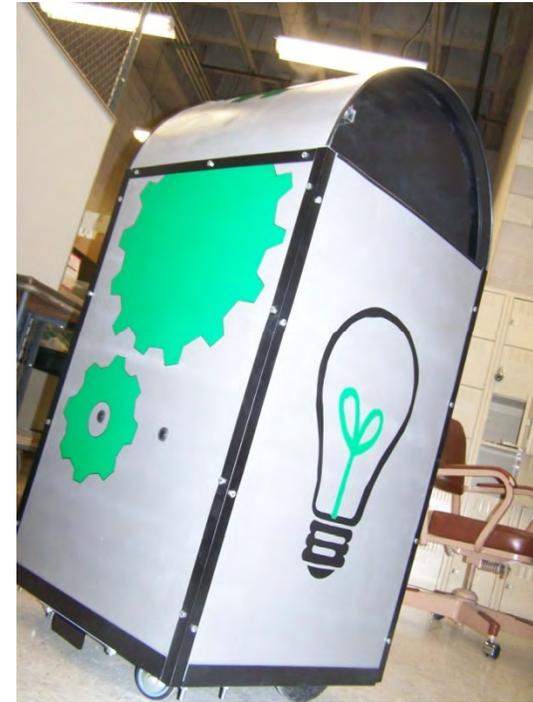
Abstract:

Have you ever seen an overflowing trash can? Trash cans that are beyond their capacity are unsightly, usually smell, and can be hazardous to the health of the surrounding people. Our solution to this problem is the Autonomous Refuse Transporter (A.R.T.). A.R.T. will improve the efficiency of trash collection and removal from high traffic areas, such as amusement parks.

For trash removal to be accomplished autonomously, A.R.T. has a sensor to detect when its self-contained trash can is full, and will operate only when full, or activated by an external control signal. When a control signal is received, A.R.T. will move itself to the appropriate location within the park, such as an on-site dump. When moving, A.R.T. will avoid collisions with obstacles, including people, and add an entertainment aspect to the mundane task of removing trash by interacting with patrons in its vicinity via audio.

Through our interdisciplinary team of engineers, A.R.T. utilizes a mechanical drive system and chassis, an electrical power system, and programmed sensors and controllers that will change how trash is collected. Later versions could also be expanded to include tracking of trash production for both environmental concerns and retail or merchandising applications.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 11:30 a.m. - Noon

Title: Wireless Network Cracker

Department of: Electrical & Computer Engineering

Project Participants: Dominic Mohrhardt and Jeffrey Richardson

Instructor: Dr. Paolo Ginobbi,

Faculty Advisor: Dr. Yoohwan Kim

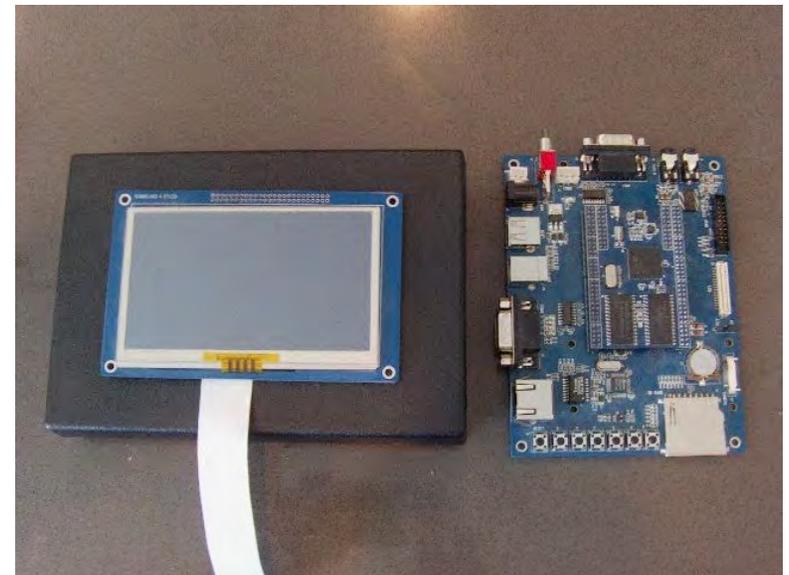
Abstract:

Modern engineering has brought about an era of wireless communications which can be very vulnerable to outside intrusion because of the wireless nature of how data is sent. Anyone with a laptop, a compatible wireless device, readily available software, and a little know how is able to receive wireless packets being sent on any 802.11 network.

Depending upon the type of encryption being used on that network, the intruder may be able to decipher the network's wireless key and have full access to the network. This is an extremely dangerous vulnerability if any classified or personal information is being sent on that network. Since standards are already in place for wireless 802.11 network encryption, the best method of fixing this problem is by testing if the network is vulnerable.

We plan to solve this problem by offering an embedded device that will run this readily available software to test the vulnerability of a wireless network.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 12:30 – 1:00 p.m.

Title: Autonomous Material Sorter

Department of: Mechanical Engineering

Project Participants: Christian Calvo, Anthony Domingo, Kimberly Hammer, Jonathan Sanchez, and Andrew Wickersham

Instructor: Dr. John Wang

Faculty Advisor: Dr. Mohamed Trabia

Abstract:

As with most designs, it all started with a need and one quote in particular epitomized that need. "Airlines in the U.S. throw away enough aluminum cans every year to build 58 new 747s." After reading this, we thought that if we could make recycling easier and more prevalent in the airline industry then not only would we be helping the environment and saving the airline industry thousands of dollars, but there might be an opportunity for us to make a profit as well. How we set out to accomplish this task was to invent a device that would tackle the recycling at the source of the problem, that overflowing trash bag that is disregarded on every flight. Once the recycling material ends up in those trash bags with the rest of the perishables the game is over. Therefore, our unit exists to sort the four most common types of recycling you would encounter on an airplane: plastic, glass, aluminum, and tin-coated steel, into four separate and distinct bins in a completely autonomous fashion for recycling at a later date. Our device also needed to be small enough to fit in the bottom of a flight attendant's beverage cart to facilitate this recycling process even further. Lastly, our device needed to be portable and run on rechargeable batteries so as not to hinder the user with cumbersome wires or other electrical connections.

The "Autonomous Material Sorter" at its simplest level utilizes sensor technology, electromagnets and a process of elimination to determine the type of material being recycled. The heart of the AMS is the Gizmo Box where the item material is determined. The Gizmo Box in sequence uses Capacitance sensors, Inductance sensors and Electromagnets to sort out plastic from non-plastic, glass from metal and aluminum from steel, respectively. Once the material type is determined, the Gizmo Box containing the item autonomously drops the item into its proper material bin below. If the AMS heart is the Gizmo Box, then the brain is the Arduino microcontroller and together, these parts sustain a lightweight, working prototype that revolutionizes the airline industry and ultimately prevents the frequent flier from literally throwing away 747s every time they fly.



Christian Calvo, Jonathan Sanchez, AJ Wickersham,
Anthony Domingo, and Kimberly Hammer

Notes: _____

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 12:45 – 1:15 p.m.

Title: Cornerstone Park – Solid Engineering

Department of: Civil & Environmental Engineering

Project Participants: Edgar Hernandez, Federico Mendez, Abdul and Jabbar Momoh

Instructor: Dr. Walter Vodrazka, Sr. PE

Client Advisor: Ms. Bonnie Kolesa

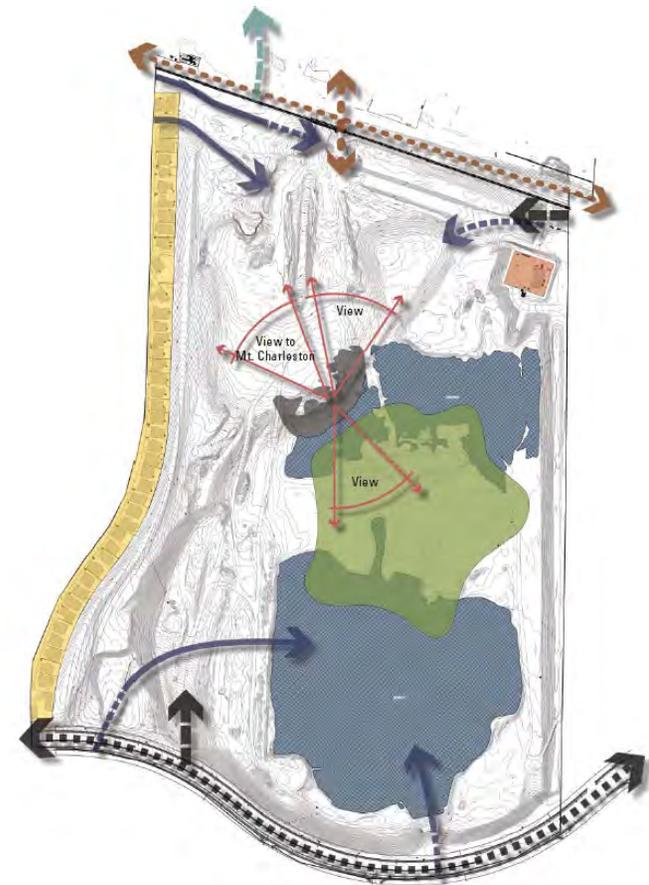
Faculty Advisor: Mr. Kenneth Lamb

Abstract:

The City of Henderson has very ambitious goals for Cornerstone Lake Community Park located at the intersection of Wigwam Parkway and North Stephanie Street. Solid Engineering has created the foundation for the ultimate completion of the park by conducting a hydrology study of the site and creating a sustainable wetland design. The work conducted by Solid Engineering took into consideration the neighboring areas to best serve the public while accommodating regional storm water management resources.

The project is composed of a multiple design phase model consisting of water quality observations and storm water management. This project has met and fits into the clients' vision for Cornerstone Park as a leisure recreational park and complies with Clark County Regional Flood Control District's Hydrological Criteria and Drainage Design Manual. The proposed wetland would improve water quality by stopping pollutants from discharging into local water reservoirs. For example, the Cornerstone wetlands would stop debris from ending up at Lake Mead. Wetlands offer various benefits such as controlling floods and recharging ground water. For our design we looked into wetlands and the process of removing nitrogen from the water. Solid Engineering held paramount the safety and well being of the community during all aspects of the design.

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Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 1:00 – 1:30 p.m.

Title: AquaProdigio Shower System

Department of: Interdisciplinary – Mechanical Engineering /
Electrical & Computer Engineering

Project Participants: Giorgio Gaputan, Andrew Gardiner, Lydia Petersen, and Se Veatrice Steward

Instructor: Dr. John Wang and Dr. Paolo Ginobbi

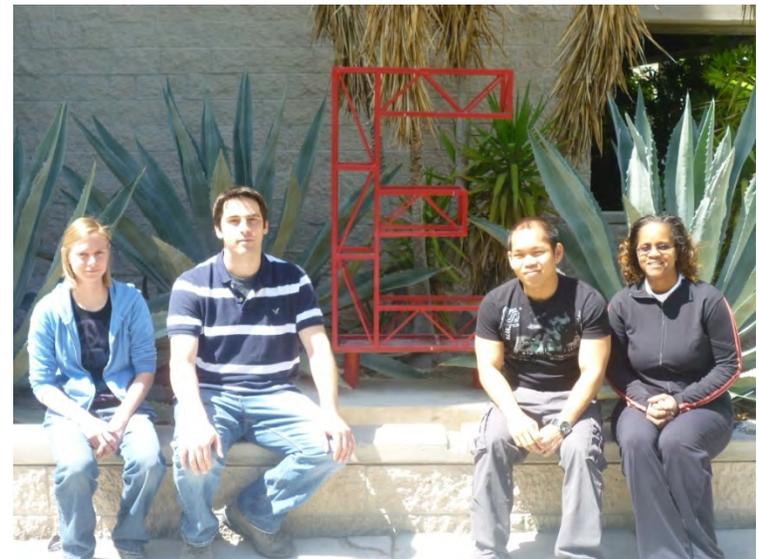
Faculty Advisor: Dr. Landsberger and Dr. Emma Regentova

Abstract:

The AquaProdigio Shower system is a state-of-the-art product for everyday shower users, who want a better showering experience. Unlike traditional showers, this contemporary shower uses a controlling device, similar to that of a thermostat, to adjust the temperature accurately, reliably, and with ease of use.

Furthermore, it capitalizes on its thermostatic/pressure balancing valve to prevent any risk of scalding. In addition to these features, the shower also implement a memory device to allow users to preset temperatures creating a more convenience for everyday use. As a result, the AquaProdigio Shower System gives the user a unique and personal showering experience.

Notes:



Lydia Petersen, Andrew Gardiner, Giorgio Gaputan,
and Se Veatrice Steward

Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 1:15 – 1:45 p.m.

Title: C.A.T. (Composite Airfoil Turbine)

Department of: Mechanical Engineering

Project Participants: Matthew Fisher, Suzette Hernandez-Fabela, Darryl Mulford, and Brian Skopal

Instructor: Dr. John Wang

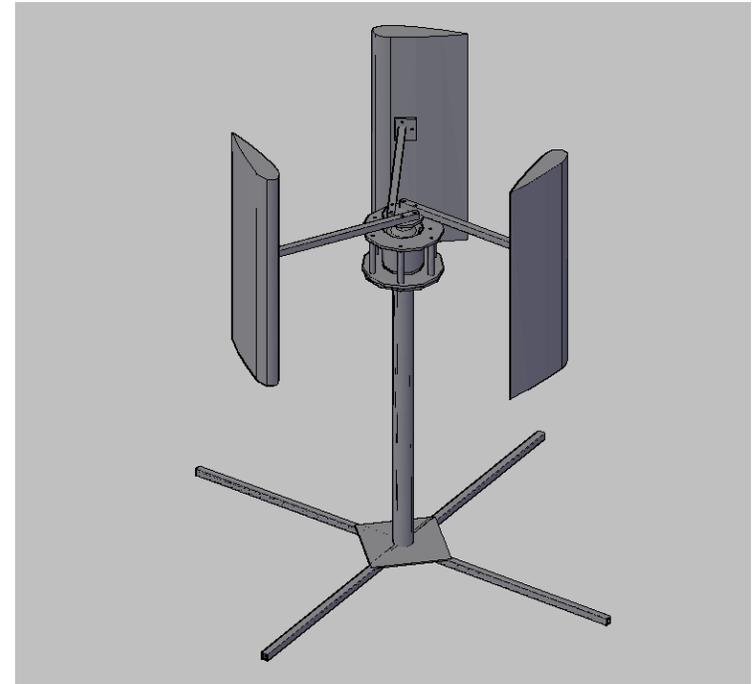
Faculty Advisor: Dr. Yi-Tung Chen

Abstract:

The Composite Airfoil Turbine (C.A.T.) is a vertical axis wind turbine designed to demonstrate the feasibility of a simple power generator which uses wind for renewable energy. There is currently a large need to find inexpensive alternative energy sources, such as wind or solar energy, to decrease the dependence on fossil fuels. C.A.T. aims to generate enough power to charge batteries (12 volt) to reveal the possibility of serving a home application. It uses more economical composites to minimize costs and reduce weight, thus increasing efficiency.

The design is focused on an air foil approach to create lift with low wind speeds to produce rotation, thereby generating electricity through the direct drive to a permanent magnet alternator (purchased from Wind Blue Power). Its vertical axis makes it ideal for low and intermittent wind. C.A.T. is also designed for basic assembly with use of household tools and limited maintenance. This design would be especially practical in remote locations where power is not readily available.

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Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 1:30 – 2:00 p.m.

Title: THE Firm – The Nevari Lookout

Department of: Civil & Environmental Engineering

Project Participants: Stephanie Espinoza-Levy, Samuel Lytle, Alan Pineda

Instructor: Dr. Walter Vodrazka

Client Advisor: Mr. Robert Welch

Faculty Advisor: Dr. Ying Tian

Abstract:

The border between Nevada and Arizona has, for the past 80 years, hosted one of the world's greatest engineering achievements, the Hoover Dam. Now, with the construction of the Hoover Dam Bypass Bridge, two world class engineering structures can be visited simultaneously. To enhance the visitation of this one-of-a-kind destination, we have designed an observation deck for the bridge that will provide an unparalleled view and overall breathtaking experience.

At 200 feet in length and extending 40 feet from the edge of the bridge, the Nevari Lookout will tie in to the existing structure of the bridge without compromising its native engineering. The key feature of the deck is a crescent-shaped glass area, where visitors can enjoy an unobstructed view of the Hoover Dam and the Colorado River below. Inspired in part by the Sky Walk at the Grand Canyon, this area is composed of several layers of DuPont SentryGlas and St. Gobain glass interlayers. This deck will not only be beneficial to tourists but will also bring national recognition to Nevada and Arizona because of its unique design and geographic location.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 1:45 – 2:15 p.m.

Title: 24-Bit Broadcast Quality Portable Audio Recorder

Department of: Electrical & Computer Engineering

Project Participants: Jimar Miller, Nicholas Morata, and Jaypee Pascual

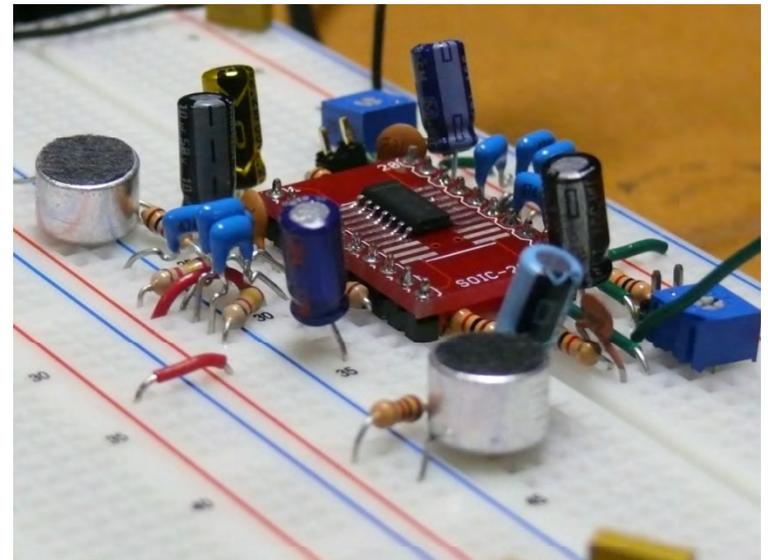
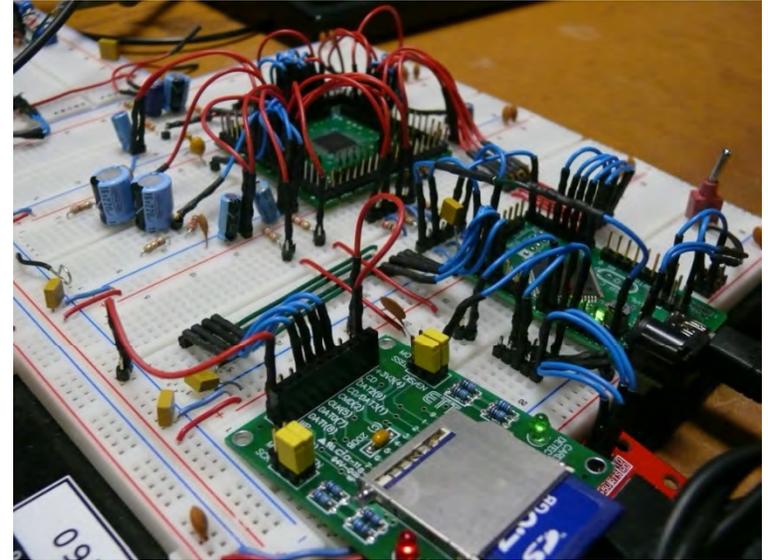
Faculty Advisor: Dr. Paolo Ginobbi

Abstract:

High quality recordings are essential for many applications. Film, music, television and radio industries rely heavily on quality audio for their products. Additionally, there is a need for portability. This portable device will save 24-bit audio sampled at those frequencies commonly used by members of the sound recording industry onto flash memory, namely, SD.

Many parts were inspected and studied, as well as the formats used commonly in the industry. This project is designed to operate under specifications designated by FAT32. The recorder will record raw data, as compression into other forms will create a loss in the quality of the audio recorded. The components chosen were selected due to their speed and ability to filter any noise, which may appear from the circuit.

Notes: _____



Senior Design Project Abstracts

Cox Pavilion

April 30, 2010

Time: 2:00 – 2:30 p.m.

Title: Alternative Energy Road Sign

Department of: Electrical & Computer Engineering

Project Participants: Michael Sharp and Stuart Wagner

Instructor: Dr. Paolo Ginobbi

Faculty Advisor: Dr. Rama Venkat

Abstract:

Project is to create a lighted sign board for use on rural highways for traffic signals, to be powered by solar/wind energy. A self-powered road sign is very desirable because of the very high cost of bringing grid power far from the power grid, and solar and wind power have the added benefits of producing no pollution and having no need to pay a power bill. A main drawback of wind and solar power is that both power sources become more expensive with a higher power demand.

We have designed our sign for extremely low power consumption using high-power LED light sources. High-power LEDs produce a very high luminescence, enough for the sign to be plainly visible even in daylight, while consuming very little power compared to typically used incandescent light sources. This sign's average total daylight power consumption is approximately 100W (the power of an average incandescent track light). With the great advantages and low cost offered by this type of road sign departments of transportation will be able to provide valuable information to drivers in areas that are currently inaccessible to communication.

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Michael Sharp and Stuart Wagner