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College of Engineering Senior Design Competition Spring 2013

University of Nevada, Las Vegas

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Senior Design

12th

Anniversary

Post-Competition Version
Winning Projects Listed Inside

Discover
the future innovation...

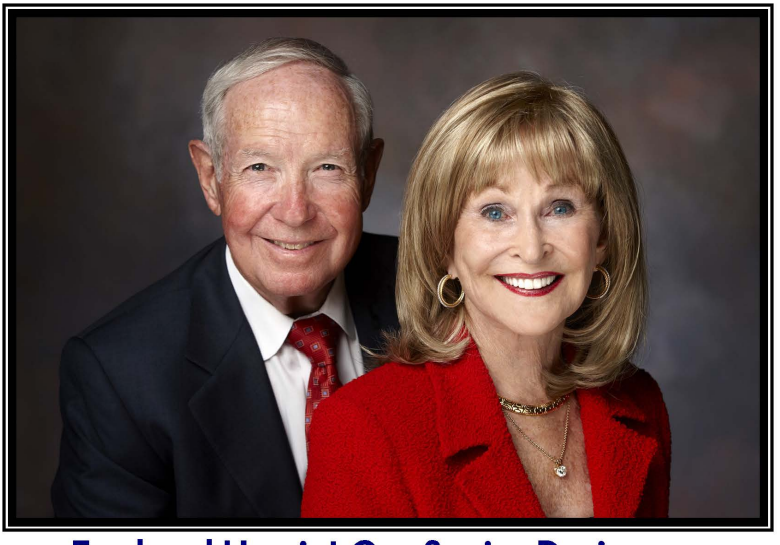
Fred and Harriet Cox

Spring 2013

Senior Design Competition

Thursday, May 9, 2013

UNLV | Howard R. Hughes College of Engineering



Fred and Harriet Cox Senior Design

Senior Design Experience

Part of every UNLV engineering student's academic experience, the Senior Design project stimulates engineering innovation and entrepreneurship. Each student in their senior year chooses, plans, designs and prototypes a product in this required element of the curriculum. Working in teams, the senior design project encourages students to use everything learned in the engineering and computer design programs to create a practical, real world solution to an engineering challenge.

Beyond the classroom...

Because of the requirement to work in teams, students also build good communication skills, presentation skills and even business writing skills. They also have to source and purchase the materials for the prototypes themselves, giving them real-world budgeting experience—all necessary skills to have in the business world.

Reward and recognition...

The rewards with Senior Design are great. A team of industry judges chooses winners in each category based on innovation, commercial potential, presentation quality and sustainability. A cash first prize and second prize are given in each discipline, as well as a grand prize. In addition, the College of Engineering—through the generosity of patrons Fred and Harriet Cox, as well as award sponsors—reimburses teams for the costs associated with creation of their prototype. This ensures that

teams are not working under unfair financial constraints, but have the resources they need to excel.

Awards are announced at an annual event in the spring, the Fred and Harriet Cox Senior Design Dinner. Nearly 600 faculty, staff, students and industry sponsors and partners attend to celebrate the achievements of these teams.

Taking it further...

Beginning in 2011, Senior Design teams were offered the opportunity to partner with MBA students from the Lee Business School who would create a business plan as part of their own curriculum. This collaboration has led to great success at both the Southern Nevada Business Plan Competition, and at the Governor's Cup. Two LLC's have been created from Senior Design projects in the past year.

In addition, Engineering alumnus Chad Miller has offered pro bono services to file provisional patents on Senior Design projects. Teams who file a provisional patent are offered an additional financial incentive to do so. In 2012, several teams took advantage of this opportunity and worked with Chad Miller at Weide & Miller, LLC to file.

Get Involved...

Teams often get project ideas from industry partners or friends of engineering who have an interesting problem or concept they would like to submit.

Teams may also be looking for an industry mentor or coach to help them throughout the year as they work on a project.

Industry partners and individuals are also offered the experience of sponsoring an award category. To find out what categories are available, or for other sponsorship information, contact Sara Portzel, Director of Development, at sara.portzel@unlv.edu or 895-2913.

Spring 2013 Senior Design Judges

Jim Barbee

Jim joined the Nevada Gaming Control Board as a lab engineer in 2000 and was appointed to Chief of the NGCB's Technology Division in 2011. His current responsibilities include oversight of the review and approval process for all gaming related technology used in Nevada, and advising the members of the NGCB on matters related to technology and gaming.

Jim received a bachelor of science in computer engineering from UNLV, and is a member of Tau Beta Pi. Prior to joining the NGCB, Jim served as a Signals Intelligence Analyst in the U.S. Army and worked as a design engineer in the area of digital image capture and processing.

Barbara Brennan

Barbara has been employed in the entertainment industry for over 35 years, currently serving as Vice President of Business Development at Morpheus Lights. She attended UNLV with a major in theatre and began her career at Cinema Services of Las Vegas.

In 1996, Barbara established Brennan Productions, Inc. to provide lighting design and technical services for the industry. In 2001, the company became the factory representative of Strand Lighting in Las Vegas, and in that capacity supported the Cirque du Soleil Projects of "Zumanity" and "KA." Barbara has also worked for the Wynn Resort and PRG Integrated Solutions.

Brad Callihan

Brad is a graduate of UNLV's College of Engineering and currently sits on the college's mechanical engineering department advisory board. He is a Senior Consultant with EMA Inc. in Las Vegas, specializing in control systems engineering and operations optimization in the water/wastewater industry, and is a Professional Engineer in Control Systems Engineering in Nevada.

Brad's team took first place in mechanical engineering at the UNLV College of Engineering Senior Design Competition in spring 2003.

Vijay Raghavan

Vijay joined IGT in 2011, bringing more than 20 years of technology and leadership experience with him. He is Executive Director for IGT SaaS (Software as a Service) and general manager for the IGT Cloud.

Before coming to IGT, Vijay was the General Manager for Cisco's Emerging Cloud Technologies. He has also led strategy, business development and engineering functions at leading companies including McKinsey & Company and Oracle Corporation. Vijay has an MBA in finance and venture management from the Wharton School, University of Pennsylvania and an M.S. in computer science from Rensselaer.

Randall Tarr

Randall was appointed Assistant County Manager on June 1, 2010 by the Clark County Board of Commissioners. He previously had served as the Director of Clark County's Real Property Management (RPM) department for nearly two and a half years.

Randall has more than 25 years' experience working in the local development industry. Prior to joining Clark County, he worked in senior executive management positions for Lewis Operating Corporation and KB Homes, and had previous experience working for the City of North Las Vegas and Carter Burgess, Inc. Randall holds a bachelor of science in civil engineering from UNLV, and is a registered Professional Engineer in Nevada.

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Interdisciplinary Award

NVEnergy

Commercial Potential Award

Dominic Anthony Marrocco

Sustainability Award

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Thank you, spring 2013 Senior Design instructors!

Department of Civil & Environmental Engineering and Construction
Dr. David Ashley

Department of Computer Science
Dr. Evangelos Yfantis

Department of Electrical and Computer Engineering
Mr. Brandon Blackstone

Entertainment Engineering and Design Program
Mr. Joe Aldridge

Department of Mechanical Engineering
Dr. Zhiyong Wang

Senior Design Competition

Presentation Schedule

	Department/Program
	Mechanical Engineering
	Electrical & Computer Engineering
NameHere.com	Computer Science
	Entertainment Engineering & Design
	Interdisciplinary
	Civil & Environmental Engineering & Construction
	Mechanical Engineering
	Interdisciplinary
	Interdisciplinary
	Computer Science
	Computer Science
	Electrical & Computer Engineering
	Entertainment Engineering & Design
	Interdisciplinary
Arcade	Interdisciplinary
	Civil & Environmental Engineering & Construction
	Mechanical Engineering
	Mechanical Engineering
Reuse Facility	Civil & Environmental Engineering & Construction
	Computer Science

Senior Design Competition

Presentation Schedule Continued

	Department
	Electrical & Computer Engineering
	Computer Science
	Electrical & Computer Engineering
	Civil & Environmental Engineering & Construction
	Mechanical Engineering
	Civil & Environmental Engineering & Construction
ool	Entertainment Engineering & Design
	Electrical & Computer Engineering
	Computer Science
	Civil & Environmental Engineering & Construction
	Computer Science
	Electrical & Computer Engineering
	Computer Science
	Computer Science
	Entertainment Engineering & Design
	Computer Science

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 8:00 a.m.
Automatic Silverware Rolling Machine
Department: Mechanical Engineering
Project Team: Silverware Rolling Team
Project Participants: Kyle Ackley, Kyle Pointer
Instructor: Dr. Zhiyong Wang
Faculty Advisor: Dr. William Culbreth

Abstract:
Each year, restaurants spend thousands of dollars to pay their employees to hand roll silverware in napkins. While these employees are rolling silverware, they are being taken away from their primary responsibilities. This automatic silverware rolling machine will be able to allow these employees to get back to their primary responsibilities, while producing the same output.

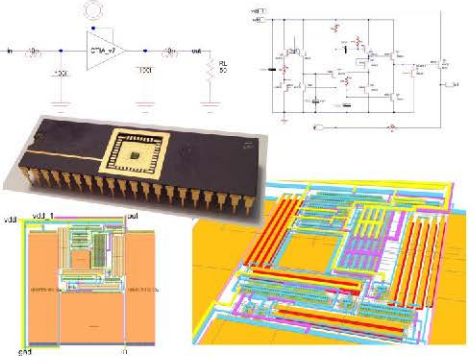
This machine is designed to be completely automatic. All a user needs to do is load the silverware and napkins, then press the START button. The machine will go through the process of putting silverware in the napkin and then rolling it into a tight uniform roll. The machine will be able to produce rolls as fast as a human can.

Left to right: Kyle Ackley, Kyle Pointer

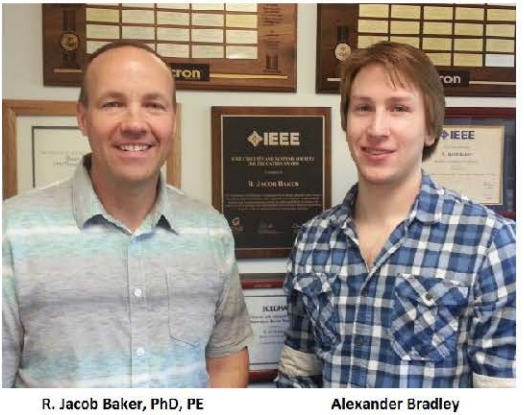
Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 8:15 a.m.
Trans-impedance Amplifier
Department: Electrical and Computer Engineering
Project Team: TIA
Project Participant: Alexander Bradley
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Dr. R. Jacob Baker

Abstract:
A photo-detector supplies a current when struck with a wavelength of radiation within its designed range. This Trans-impedance Amplifier is designed to take the current generated from this photo-detector and turn it into a voltage and amplify. This amplified voltage (possibly given further amplification) can then be used to accurately identify an event.



The Trans-impedance Amplifiers in this project were designed for applications in Laser Detection And Ranging (LADAR). The circuits were laid out on a fabricated test chip.



R. Jacob Baker, PhD, PE Alexander Bradley

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 8:25 a.m.
Project InsertSuperMcAwesomeProjectNameHere.com
Project Team: Team Two
Department: Computer Science
Project Participant: Alvin Lam
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
This is a card game app developed for the Apple iOS known as Big Two. Popular in Asia, it is also known as Deuces, as well as various other names. It uses a standard 52 deck of playing cards, and usually seats four players. The objective is to be the first to get rid of all of your cards by playing various poker hands; however, in this game, the twos are the high card, and suits matter. It is similar, in essence, to Crazy Eights, since what you are allowed to play is determined by the previous played hand. It is intriguing to try to figure out what your opponents have in their hands, so you can employ the most successful strategies. Like most well-made games, it is simple to learn but difficult to master.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 8:35 a.m.
Camera Caddy
Department: Entertainment Engineering and Design
Project Team: The Clique
Project Participants: Kellilyn Monar, Ashley Rogers
Instructor: Mr. Joe Aldridge

Abstract:

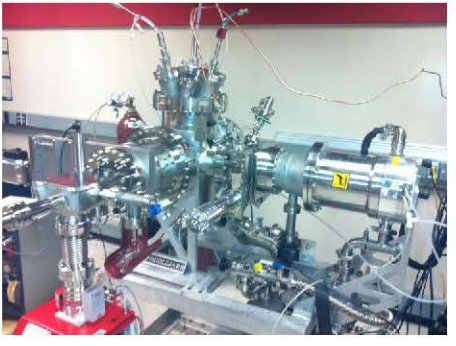
My cousin, Christopher Polk, is a senior staff photographer for Getty Images. He had expressed to me a need for some sort of gadget for red carpet photographers to use while they shoot from behind a metal barricade or a hedge. These photographers don't really have a space to put their gear unless they wear a bulky vest that allows them to hang equipment; otherwise, they set their equipment on the hedge in front of them.

To solve this problem, Ashley and I designed a "camera caddy" that would fold over the barricade or hedge and provide the photographers with various pockets to place their camera equipment, as well as personal items. The photographer will have everything they need for that shoot organized right in front of them. They will have quick and easy access to what they need, when they need it, for that perfect shot.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 8:50 a.m.
PS-Eye
Department: Interdisciplinary
Project Team: PS-Eye
Project Participants: Matthew Johnson, Louis Pombo
Instructors: Mr. Brandon Blackstone, Dr. Zhiyong Wang
Faculty Advisor: Dr. Robert Schill
Technical Advisor: Mr. Stanley Goldfarb

Abstract:



Imagine trying to do paperwork in the middle of a sandstorm. Now throw in a thunderstorm shooting off a constant barrage of lightning. Seems like it would be impossible environment to get anything done right? Yet, such products as windows, razor blades, precision circuitry, and hard drives are constructed under very similar conditions every day while inside of a vacuum chamber. Something in the system is eventually bound to go wrong when operating under such extreme conditions. There are numerous sensors to alert technicians that something is wrong within the system, but the only way to actually see the problem is through a tiny two-inch window.

The goal of this project was to design a camera that would function inside of a volatile vacuum environment. One problem that this camera will encounter is placement within a chemical or vapor deposition chamber. Within a deposition chamber, not all of the substance lands on the substrate target; some of the material bounces around the chamber, where it eventually settles. Over time, this loose material will eventually cover the window that current chambers implement, making it impossible to see inside.

This project will circumvent this problem by utilizing a motor that will rotate a shielded glass disk in front of the camera. Whenever it becomes too hard to see, the motor will turn the wheel to a new position to provide visibility until the following rotation.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

CEE: Second Place Winner

Time: 9:05 a.m.
Project AirConn
Department: Civil and Environmental Engineering and Construction
Project Team: JMH Engineers
Project Participants: Jaffer Almosawy, Matthew Burge, Janegela Cretty, Humberto Franco
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Ying Tian
Technical Advisors: Innova Technologies, CA Group, G.C. Wallace

Abstract:
With the completion of Terminal 3 at McCarran International Airport, any increase in tourism will affect the ability to move people to and from the strip at a comfortable capacity. The Las Vegas Monorail Company has proposed an expansion of the monorail from the existing MGM Station to the McCarran Airport at Terminals 1 and 3. The current monorail is capable of traveling the strip in just 15-minutes and operates 365 days a year. It has also shown to reduce 23 tons of emissions into the atmosphere by taking an equivalent of 1.9 million vehicle miles off Nevada's roadways.

JMH Engineers was selected to perform the structural design of the proposed monorail guide-way system by providing the most economical and serviceable solution for the design and construction of the monorail system. Complying with safety and code regulations, the structural design consisted of two alternative beam designs, one post-tensioned and the other pre-stressed. The pier design was done using RC-Pier structural design program. Two alternative connection designs were looked at and decided on by the most economical alternative. Using ACI 358 1.R, AASHTO LRFD Bridge Design Specification, and referencing Sao Paulo structural design criteria, an 80" x 27.16" beam section was chosen. The design of this monorail guide way system connects the Las Vegas Strip to one of the busiest airports in the country, making Project AirConn just a little part of a future bigger picture of a mass transit system connecting the McCarran International Airport to the Las Vegas Strip.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

ME: Second Place Winner

Time: 9:20 a.m.
Variable Pitch Quad Rotor Kopter
Department: Mechanical Engineering
Project Team: QuaRK
Project Participants: Muhammad Umair Ayub, Gregory Friesmuth
Instructor: Dr. Zhiyong Wang
Faculty Advisor: Dr. Woosoon Yim

Abstract:
Unmanned Aerial Vehicles (UAVs) are a booming industry, with over five billion dollars in annual sales, with 11.5 percent annual growth. This number is only going up as the military all over the world develop unmanned aircraft squadrons; in addition, a growing civilian market is emerging.

One major market in UAV development is the Micro Aerial Vehicle (MAV), which is a small, compact aircraft able to be flown by anyone with little experience. One of these designs is the quadrotor, which utilizes four propellers fixed to a frame and is controlled using a microprocessor to maintain balance. This structure offers many benefits over traditional aircraft designs, including larger payloads, faster response, greater stability, and longer flight times. Applications for this technology are nearly endless and include search and rescue, indoor and outdoor radiation detection, wildlife conservation, hunting, aerial photography, news casting, forward observance, and target locating.

Our project takes the tried-and-true design of the quadrotor and improves upon the flight characteristics by using variable pitch propellers. This means that the aircraft changes thrust by changing the angle of the propellers instead of changing the speeds of the motors. This method promises faster response times, more stable flight, and inverted flight, all of which traditional fixed propeller quadrotors cannot achieve. In addition, our aircraft is equipped with a live-camera system, where the pilot can see what the aircraft sees while flying, and an onboard global positioning system (GPS) that can pilot the airframe autonomously without any pilot input.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 9:35 a.m.
Solar Powered Pool Skimmer
Department: Interdisciplinary
Project Team: APSG (Automated Pool Skimmer Group)
Project Participants: Luis Gallegos, Alfred Johnson, Tyler Nickerson, Russell Wells
Instructors: Mr. Brandon Blackstone, Dr. Zhiyong Wang
Faculty Advisors: Dr. Robert Boehm, Dr. Venki Muthukumar

Abstract:
Between the heat, dry air, and unallocated time in summer, people need a way to fill their time in an active, invigorating way without dying of heat exhaustion. Therefore, the swimming pool is a seemingly mandatory item to have during the Las Vegas summer. Swimming pools, however, seem to be a trap for all sorts of unwanted debris.

Our senior design project is an automated pool skimmer that reduces pool maintenance and maintains a clean pool environment that people will want to swim in. This allows for an active, outdoor activity in which students can even meet and socialize in the summer heat.

The pool skimmer is created using dense polystyrene foam covered in a latex paint, making it lightweight, chemical resistant, solar resistant, and esthetically appealing. Power for the skimmer comes from a solar panel connected to an absorbent glass mat battery (AGM). This makes the pool skimmer extremely economical, efficient, low maintenance, and eco-friendly.

The program and chip for the skimmer are custom-made; this allows for an intelligent skimmer that uses sensors, so it will never run into a wall or get stuck in the corner of the pool. This reduces maintenance even further. Finally, the skimmer is powered by two motors mounted at the back of the collective netting in order to create a flow through the middle of the skimmer; this causes more debris to be collected for each pass of the pool than any other skimmer on the market.

Left to right: Alfred Johnson, Luis Gallegos, Russell Wells, Tyler Nickerson

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 9:50 a.m.
Induction Braking: Rollercoaster
Department: Interdisciplinary
Project Team: CEED
Project Participants: Jodi Chee, Sean Greener Jr., Samantha Suffle
Instructors: Mr. Joe Aldridge, Dr. David Ashley
Faculty Advisor: Mr. Joe Aldridge
Technical Advisors: Dr. Yahia Baghzouz, Dr. Robert Boehm
Community Advisors: Juan Enriquez, Milko Montalvo

Abstract:
Major emerging trends are energy efficiency and energy conservation. Although both initiatives help the environment, they are different. Energy conservation is achieved through behavior, and energy efficiency is achieved through technology. Energy efficiency has influenced technological strides from fluorescent light bulbs to hybrid vehicles. Why not apply this energy efficiency to an entertainment aspect: rollercoasters.

Rollercoasters were first developed in the 15th century to entertain people during the Russian winters. However, the Golden Age for rollercoasters didn't hit until the 1920s. The Great Depression crippled the industry, but rollercoasters were a booming business. Currently, there are 2,400 rollercoasters worldwide. People seek the thrills of rollercoasters more than ever. Although rollercoasters have evolved tremendously since the first "ice rollercoaster," there is still much advancement to be made. Rollercoasters are known for thrills, but not for being energy efficient. We hope to change that.

CEED proposes an energy-efficient rollercoaster, where the key innovation is the braking system. The design proposal includes an energy-efficient linear magnetic braking system that is achieved through induction. The basic design is a copper fin on the bottom of a rollercoaster cart that passes through two magnet plates of the braking system; the braking system itself will be mounted to the track. When the copper fin passes through the magnet plates, energy is produced. We intend to harness this untapped energy to power lights and devices of the rollercoaster. Along with an energy-efficient braking system, the structural design of this rollercoaster is based on safety standards.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 10:20 a.m.
Pizza App
Department: Computer Science
Project Participant: Siavash Akrami
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

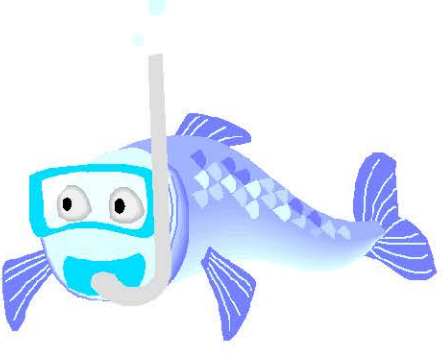
Abstract:
Pizza App is designed to show the steps to make delicious pizzas at home in a fun and amusing way. The app instructs the user to make the pizza dough, prepare the sauce, select toppings, and bake the pizza in home ovens. This app offers a variety of pizza sauces, toppings, baking techniques, and slicing patterns, so that the user can make a very specialized pizza at home. In addition, users can edit the instructions and put their own recipes into the app. The app will be available in the App Store for iPhone users.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 10:30 a.m.
Remmy
Department: Computer Science
Project Team: Remmy's Revenge
Project Participant: Pratyusha Panchangan
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Christopher Parker

Abstract:
HELP!! Remmy has been thrown out of the ocean and needs your help to survive in this new environment. His world has been turned up-side down. There are things trying to hurt him. Your objective is to keep him alive and get him back to the ocean as soon as possible. Help him collect water bubbles and destroy foes. How long can you survive?

Remmy's Revenge is done in Cocos2D using the Xcode IDE. Cocos2D is the leading, royalty-free, open-source 2D game engine. Coded in Objective C, it is native to Mac iOS but can easily be compiled to work with Andorid products with the same codebase using cocos2D-X.

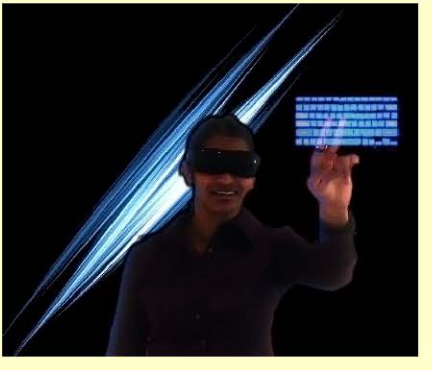


Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

ECE: First Place Winner

Time: 10:40 a.m.
Ghost Hand Keyboard
Department: Electrical and Computer Engineering
Project Team: ASC 2 Design
Project Participants: Marc Gurney, Michael Misch
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Dr. Brendan Morris

Abstract:



The emergence of commercially available Augmented Reality (AR) Glasses has the potential to transform the consumer-computer experience. Like most emergent technologies, their creation raises questions as to its applications and how users will interact with it. Current upcoming iterations of AR Glasses require that consumers utilize keypads or voice commands to interact with them; however, keypads are very restrictive and voice commands are very unreliable.

ASC 2 Design envisions a more elegant solution. The Ghost Hand Keyboard (GHK) that our team is developing takes advantage of both the ability of AR Glasses to display a personalized image to the user, and recent advances in gesture detection to create a unique interface. The GHK device is worn on the wrist, and the user pantomimes gestures over the device, like an imaginary keyboard. The diffusion device emits an infrared (IR) field, which is reflected off the hand of the user and is read from a complementary metal-oxide-semiconductor (CMOS) camera on the same device. The image data is interpreted into gesture data, and sent to the AR Glasses, which translate this data into a visual symbolization of the hand or pointer in the user's field of vision. This symbol or pointer allows the user to interact with a digitally displayed keyboard or icons.

Our team envisions this device to ultimately be watch-sized and as non-intrusive as the Augmented Reality Glasses are themselves.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

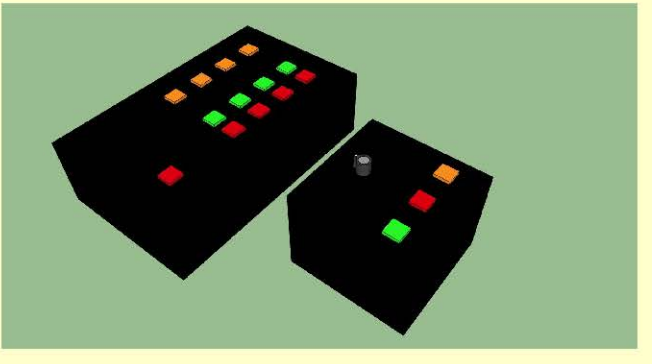
EED: Second Place Winner

Time: 10:55 a.m.
Q-Fi: Wireless Cue Light System
Department: Entertainment Engineering and Design
Project Team: Team Q
Project Participants: Lee Buckley, James Cogan, Adam Piotrowski
Instructor: Mr. Joe Aldridge
Faculty Advisor: Mr. Joe Aldridge

Abstract:
During the production of a live entertainment event, coordination is critical to ensure the safety and wellbeing of performers, technicians, and audience members, as well as equipment. One way to achieve this coordination is with an intercom system or headsets; however, headsets are not always a viable option. Performers may be waiting to make an entrance, and technicians may be moving across the stage or in a position that is difficult to be using an intercom system.

Cue lights are an alternative/supplement to an intercom system. Instead of speaking back and forth, a system of lights is used to communicate a "standby" and "go" to the performer or technician. With Q-Fi, there is a way for wireless two-way communication to happen so that the stage manager, who is controlling the system, can be notified if a problem arises.

The backstage area of any live event is already inundated with cables of every size and type; being wireless not only cuts down on the amount of cable that needs to be placed, it also decreases the amount of time needed to set up and take down an event. Mobility is also gained by having a wireless system, as a Q-Post (an operator station) could be placed on a moving piece of scenery. No wire or cable has to be run to the moving piece, but communication is still maintained to whoever may be on or behind the piece of scenery. Q-Fi can provide convenient, necessary coordination without the cost or logistics associated with an intercom.



Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Interdisciplinary & Commercial Potential

Time: 11:10 a.m.
The Reactor
Department: Interdisciplinary
Project Team: BRiNK
Project Participants: Niloufar Afnani, Ron Bohne, Brian Corpuz, Khoa Vo
Instructors: Mr. Brandon Blackstone, Dr. Zhiyong Wang
Faculty Advisors: Dr. Venki Muthukumar, Dr. Mohamed Trabia, Dr. Woosoon Yim
Technical Advisor: Terry Kell

Abstract:
In today's busy lifestyles, we tend to miss things right before our eyes and forget what is really important to us. Life is precious, and we need to spend as much time as possible with our loved ones, especially our children. Many inventions allow us to save time and help maximize our lives, including dishwashers and automobiles. Team BRiNK offers the Reactor, another helpful, yet simple, solution for parents and all people who know and have children.

Picture a mother, and her infant, who has just parked her car at the neighborhood supermarket. She jumps out of the front seat and unfolds a stroller out of the trunk. She quickly starts fumbling the unlocking mechanism, when suddenly her baby bursts out in tears from the sound of her fuss. Finally, unfolding the stroller, she picks up her baby out of the car seat and lays her down into the stroller. She starts strolling towards the supermarket entrance when she realizes she left the diaper bag. She gets to her car door when she hears a loud cry. Quickly turning around, she spots the stroller rolling towards the open street where who knows what happens next.

The Reactor is an infant carrier that folds at the touch of a button and features auto-locking brakes that is enabled when the handle is released. It functions as an infant carrier that attaches Graco®and other similar infant car seats to the frame. For added safety, there are LED lights to light the path.

Left to right: Brian Corpuz, Khoa Vo, Ron Bohne, Niloufar Afnani

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 11:25 a.m.
ExeRA: Exercise and Rehabilitation Arcade
Department: Interdisciplinary
Project Team: Ruedas
Project Participants: Nolan Moore, Maria Ramos, Alex Solis, Zaira Sotelo, Francisco D. Vargas
Instructor: Mr. Brandon Blackstone, Dr. Zhiyong Wang, Dr. Evangelos Yfantis
Faculty Advisor: Dr. Woosoon Yim
Technical Advisor: Dr. Pushkin Kachroo

Abstract:

Imagine a world where the word "exercise" no longer has a negative connotation, where both the able-bodied and disabled can get a workout in a safe and fun environment.

That is the world ExeRA creates: the Exercise and Rehabilitation Arcade. ExeRA will revolutionize how anyone – from the general public, to the recovering physical therapy patient, all the way to children and adults with mild mental disabilities – can stay active while building strength without the risk of injury.

The environment of ExeRA combines a vivid visual display, upbeat sounds, and realistic motion for a 4-D effect that will have the user feeling as if he or she is in the displayed world. ExeRA combines swift mechanical movements with the power of actuators, computer-generated visual displays, and an electronically engineered connection between what the user sees and physically experiences.

With the power of engineering knowledge, a workout in this machine should be "no sweat" to tackle!

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 11:40 a.m.
The D-Regulator
Department: Civil and Environmental Engineering and Construction
Project Team: LFG Engineering
Project Participants: Hugo Corral, Cesar Armando Lopez
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Alexander Paz
Technical Advisor: Mr. Walter Vodrazka, Jr.
Community Advisor: Dr. Pushkin Kachroo

Abstract:
Last year, nearly 40 million visitors traveled from all over the world to stay, relax, and gamble on the Las Vegas Strip. As the entertainment capital of the world, Las Vegas is heavily dependent on tourism. UNLV's Center for Gaming Research estimated that in 2012, tourists infused nearly 15.3 billion dollars into Las Vegas Strip casinos. As Las Vegas finally begins to recover from rough economic times, there is one problem that could threaten the city's progress and primary industry: the safety of pedestrians.

From the high profile shooting and deadly car crash on the Strip earlier this year, to the increasing epidemic rise of vehicle-to-pedestrian accidents, pedestrian fatalities in Las Vegas have dominated news headlines. For the millions of tourists who will visit the Strip each year, LFG Engineering has an innovative solution that will ensure their safety.

The Don't-Walk Regulator (D-Regulator) will safely prevent pedestrians from unlawfully crossing as oncoming traffic enters a resort, thus averting potential accidents. The D-Regulator will increase the safety of pedestrians and will also ease congestion and better regulate traffic on one of the busiest streets in the world.

In addition to increasing safety, the D-Regulator will provide additional revenue and attractions to prospective resorts in Las Vegas by installing a unique digital advertisement system.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

ME: First Place Winner

Time: 12:55 p.m.
Stirling Air Conditioner
Department: Mechanical Engineering
Project Team: Stirling Innovations
Project Participants: Keaton Frerker, Jena Junsay, Kaipo Kekaula
Instructor: Dr. Zhiyong Wang
Faculty Advisor: Dr. Yi-Tung Chen

Abstract:

The goal of Stirling Innovations is to design a new air conditioning system that utilizes the Stirling cycle. By reversing the Stirling engine cycle, Stirling Innovations can utilize the thermodynamic properties of a fluid to convert mechanical energy into a temperature gradient.

In this system, gas is expanded and compressed in a closed system. When the fluid in the system is expanded, heat energy is transferred into the fluid from the enclosing material, causing it to become cold. After the expansion has occurred, the air is moved over by the stroke of the piston and compressed. The compression allows for the energy brought in by the system to be rejected as heat, satisfying the First Law of Thermodynamics. The cycle is repeated continuously.

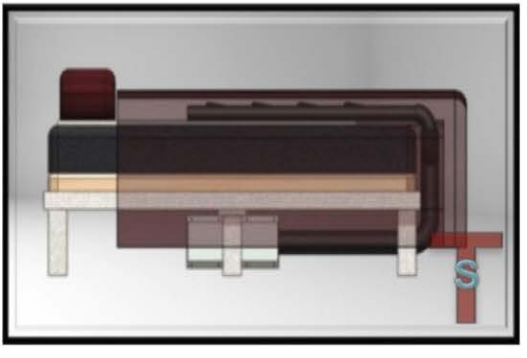
The Stirling refrigeration cycle is proven with applications in cryogenics. This new system is designed to replace the conventional vapor compression of air conditioning systems in residential and commercial buildings. There are many advantages to the Stirling cycle, most importantly, the potential to reduce energy consumption by 10 percent. A Stirling engine will also reduce maintenance issues associated with vapor compression systems; therefore, a compressor will no longer be required. This will improve reliability and reduce down-time, as there will be fewer components with the potential to fail in the system.

The project will also eliminate the use of greenhouse gases because air is used as the working fluid. The environmental implications are a driving factor in the development of the Stirling Air Conditioner.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 1:10 p.m.
Thermopod
Department: Mechanical Engineering
Project Team: Thermopeutic Solutions
Project Participants: Patrick Arnold, Ryan Schroeder, Calvin Wong
Instructor: Dr. Zhiyong Wang
Faculty Advisor: Dr. Hui Zhao

Abstract:
Under the hot Nevadan sun exists a unique opportunity to change the landscape of innovation in comfort forever! Have you ever imagined the perfect night of uninterrupted sleep? It probably did not include the extreme temperatures of the Las Vegas desert. The remedy: Thermopod by Thermopeutic Solutions.



The Thermopod innovation provides an optimal sleeping environment under a vast range of operating conditions. From the very hot to the very cold, Thermopod utilizes three different power settings in order to cool you off from even the most intense heat wave. Conversely, cutting-edge heating technology is used to warm the insides of your blanket for those long and cold winter months. With the inclusion of comfort settings such as a "Breeze" simulation – by which the air is gently oscillated from low to high speeds in order to subtly lull you to sleep – you might just find yourself drifting off to that "special island getaway" you always wished for!

The true value of Thermopod is its ability to deliver consumers an opportunity to conserve energy and save money in the process. Not only will expensive energy bills be avoided, but also your much-needed rest will not be sacrificed in the process. In this sense, Thermopod exists as the innovation of choice for consumers in need of a good night's sleep!

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 1:25 p.m.
Searchlight Water Reclamation and Reuse Facility
Department: Civil and Environmental Engineering and Construction
Project Team: PCK&B
Project Participants: Brooklyn Buzzone, Mathew Carlson, Gurtarpreet Kaur, Geraldine Joanna Perez
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Daniel Gerrity
Technical Advisor: Mr. Guy Voss
Community Advisor: Mr. Adam Werner

Abstract:
Groundwater recharge is a recent method designed to create a sustainable water distribution system. This is a process in which wastewater is treated to strict disinfection standards and injected back into the groundwater system. This allows for the use and reuse of water over time, with losses only attributed to evaporation or irrigation.

Southern Nevada is an arid region with limited access to water resources and an unclear future of water sustainability. Searchlight is a small town, home to 900 people located in Southern Nevada. Currently, Searchlight acquires all of its potable water through the groundwater basin below. Over time, the water table has lowered a total of 30 feet. The current wastewater treatment consists of a system of evaporation ponds, where approximately 90,000 gallons per day (gpd) are sent to evaporate.

This project provides a plan and design for a wastewater treatment plant that will treat the water to the proper standards and then use this water to recharge the aquifer. This will create a sustainable system of continually cycling water for the town. Primary treatment, secondary treatment, disinfection, and groundwater recharge are designed to meet direct recharge goals set forth by California's Title 22 and the Environmental Protection Agency (EPA), while also considering sustainability, energy requirements, and cost efficiency. The final design provides a water treatment facility that meets and exceeds treatment standards, injecting water cleaner than drinking water standards into the groundwater below, and ensuring the quality and supply of future drinking water to the town.

Time: 1:40 p.m.
Meh
Department: Computer Science
Project Team: Two
Project Participant: Dan Ho
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
A speedometer is not always accurate on a motorcycle. Manufacturers state higher speeds than actual for operator safety, so you might not be going as fast as you think you are. There are also many easy and common modifications that riders utilize, such as changing sprockets and tire size. These changes completely throw off the speedometer, which is based on a particular setting. By using this app, however, that problem can disappear.

What makes motorcycles so much fun? Well, sure, it is fun to go in a straight line really, really fast; however, anyone can do that. One of the most exhilarating moments is going down a twisting track and taking turns at high speeds. This app can track lean angles, which can help the rider improve his or her ability. Besides lean angles, the user also can track their "0 to 60" times, along with other interesting data. It is also easier to see skill progression by using cold, hard numbers.

It can be distracting and dangerous to check your phone while operating a vehicle. That is why the main interface features large numbers, so even at a quick glance, it is easy to get information. Finally, all the data can be viewed at a later time, preferably while not riding.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 1:50 p.m.
Heliotrope Modernization
Department: Electrical and Computer Engineering
Project Participants: Dilhan Bulegoda Arachchige, Michael Kraut
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Dr. R. Jacob Baker

Abstract:
The Heliotrope in Tam Hall Alumni Center is an important structure that incorporates engineering and art. The structure tracks the sun, wind direction, and outside temperature. The sun component uses two large rings that move to match the sun's position. The wind component uses a ring of lights that light up based on the direction the wind is blowing. The temperature component uses drums that go off based on the temperature outside.

For a few years now, the Heliotrope has been broken down; in addition, much of the technology used in the structure is now outdated. The goal of this project is to restore the structure to working order and replace some of the components with their modern counterparts.

Heliotrope, top view

Heliotrope, bottom

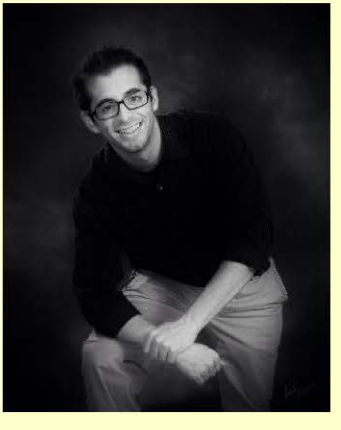
CS: Second Place Winner

Time: 2:05 p.m.
Super Math Matching Fun Time!
Department: Computer Science
Project Team: You Math'd Up
Project Participant: Michael Branchini
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
Over the past two years, I have worked as a tutor with the America Reads Counts program here at UNLV. This is a program where local school kids (K-12) can come and receive help with homework, projects, or even tutoring, for free. Being a computer science major, I mostly help kids with math; however, to make a long story short, we're doomed. I see a lot of kids trying to do math at their grade level when they don't possess the basic fundamentals needed to be able to solve their work.

SMMFT is a twist on the game of Concentration; however, instead of matching similar cards, what you are matching are cards that add up to a sum. This game is targeted mostly for pre-K and 1st grade. The central idea is the gamification of learning basic addition facts. When I work with kids, I am surprised how many still have to add simple numbers on their fingers in grade levels where it could be quickly done in their heads. By making a game out of learning these facts, based on how fast you know them, my goal is to "trick" kids into learning math while playing a game.

There are two modes to this game. The first is a time attack, where the player has to score as many matches as possible in 50 seconds. The second is a VS mode, where two people compete: the first player to break the other player's five hearts wins.



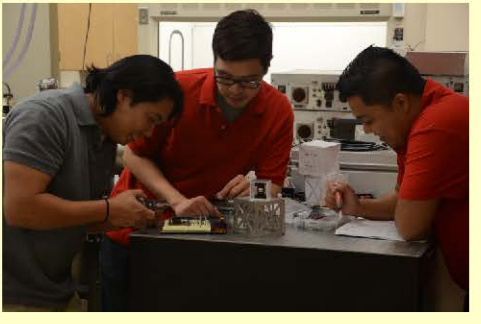
Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

ECE: Second Place Winner

Time: 2:15 p.m.
AC Charge Management System (CMS) for Gravity and Radiation Environmental Arial Trans-Small Satellite Surveyors (GREATS)
Department: Electrical and Computer Engineering
Project Team: SunKube
Project Participants: Arvin Bautista, Mark Jayson Manipon, Kenji Reyes
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Dr. Ke-Xun Sun

Abstract:

The Modular Gravitational Reference Sensor (MGRS) (Sun, 2006) is a highly sensitive, space-borne instrument requiring unprecedented precision, used for accurate spacecraft positioning. The MGRS is made up of an inner proof mass, which is caged inside a larger, normal-sized satellite. Most of the outside forces that might disturb the proof mass – such as atmospheric drag and solar wind – are blocked by the housing. However, highly energetic particles, such as cosmic rays, can still penetrate the satellite housing and will charge the proof mass. Such a charge buildup will cause an electrostatic disturbance that will distort the signal necessary for scientific measurement and drag free control.



The MGRS charge management system (CMS) is designed to eliminate charge buildup in the proof mass. This is achieved by photoemission, a process in which an electron is released from a solid material; as a result of photoelectric effect, the electric effects are produced by light. In order to efficiently eliminate the electrostatic charge buildup in the proof mass of the MGRS, GREATS will use an AC charge management system (CMS) based on ultraviolet light-emitting diodes (UV LEDs). The UV LEDs are smaller in size and weight, have less power consumption, use a wide spectrum, and have a high dynamic range; these characteristics make UV LEDs a more favorable choice than the traditional Mercury (Hg) lamp system. UV LED CMS can also improve the quality of semiconductor processing.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 2:30 p.m.
WWTP Renewable Energy
Department: Civil and Environmental Engineering and Construction
Project Team: JBM Consultants
Project Participants: Mike Rhodes, Jonathan Rocha, Brandi Tenner
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Daniel Gerrity

Abstract:
Cleaning our water is no small task, and requires an energy-intensive process to maintain strict water quality standards. In fact, wastewater treatment is one of the most energy-consuming municipal practices. As the price of energy increases, renewable energy is being added to the agenda of many wastewater treatment facilities in order to reduce costs.

The Water Pollution Control Facility of the City of Las Vegas is among many plants nationwide that want to become more energy efficient in their wastewater treatment process. This facility serves more than 500,000 residents, tourists, and businesses in the city and treats an average of 45 millions of gallons of water per day.

JBM Consultants analyzed the energy consumption at the City of Las Vegas - Water Pollution Control Facility to propose an alternative design to its current process that would include renewable energy. Our proposed solution includes the combination of pasteurization, solar energy, and bio-solids to increase the renewable energy usage of the plant, thus decreasing its operating costs.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 2:45 p.m.
Motorized Shelving System
Department: Mechanical Engineering
Project Team: Motorized Shelving System
Project Participants: Tyler Ercolani, Jacob Lynch, Phillip Nix
Instructor: Dr. Zhiyong Wang
Faculty Advisor: Dr. Mohamed Trabia

Abstract:
Many people who are confined to a wheelchair cannot access their overhead kitchen cabinets. Current products on the market lower the entire cabinet to a more accessible level, which provides access to the bottom shelf; however, this still does not allow access to the top shelf of the cabinet. In order to resolve this issue, our design incorporates a pulley system combined with standard drawer slides – used both vertically and horizontally – that enable the top shelf to come out of the cabinet and down to the user.

This system, combined with a lowered cabinet, allows for users to not only reach the bottom shelf, but also the top shelf of their cabinet by using the accessible controls provided. This design will give people in wheelchairs more access to their overhead kitchen cabinets, as well as the independence to use more of their kitchen without assistance.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Sustainability & Grand Prize

Time: 3:30 p.m.
Maji to Tuleeni
Department: Civil and Environmental Engineering and Construction
Project Team: M2TET
Project Participants: Annie Bouck, Christian Datuin, Eric Murphy, Brian Vincent
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Jacimaria Batista
Technical Advisor: Zone Engineering

Abstract:
Every day, thousands of African villagers in Moshi, Tanzania embark on a three-mile round trip to obtain their daily water needs from a spring. These villagers return carrying nearly 50 pounds of water. Further south of the village, 82 orphans will soon reside in the Tuleeni Orphanage, which is currently under construction through a Christian mission organization called The Virtua Foundation. Both the villagers and orphans would benefit greatly from a water transportation system. The Maji to Tuleeni Engineering Team (M2TET) became aware of this need in early January, after coming in contact with The Virtua Foundation. In Swahili, Maji means "water," and Tuleeni means "care for us"; hence, M2TET's design provides water to care for the villagers and orphans.

This design requires a water intake structure at the spring to collect the water, a pipeline to transport it, a cut-and-fill analysis to bury the pipe, and a chlorination tank to disinfect the water. The first alternative only utilizes the spring as the sole water source. The second alternative takes into consideration the abundance of available rainfall, due to Moshi being located in a tropical climate. This alternative not only utilizes the spring, but also harvests the rainfall.

Once constructed, the villagers and orphans will have access to water without making a strenuous journey. M2TET aims to provide an effective, yet realistic design that may be easily implemented in a third-world country.

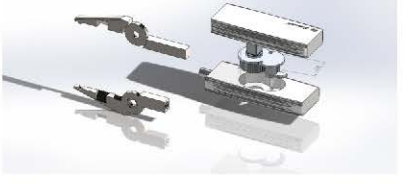
Left to right: Eric Murphy, Annie Bouck, Christian Datuin, Brian Vincent

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 3:45 p.m.
"Big Sammich" the Automation's Multi-tool
Department: Entertainment Engineering and Design
Project Team: Club Sammich
Project Participants: Justine Benoit, Thomas Drach, Charles Ticer
Instructor: Mr. Joe Aldridge
Faculty Advisor: Mr. Joe Aldridge

Abstract:
For most theater technicians, especially automation technicians, maintenance work can be a hassle, since most applications require a multitude of hand tools that need to be brought to the most obscure places, like, for instance, a cabinet up on the grid or a motor underneath the lifts. Also, there is the inconvenience of having to run to the tool cabinet because the technician failed to bring a tool for that specific application.

If only technicians could have all the tools they need in one hand-tool; how convenient would that be? Wonder no more: Club Sammich has designed the 'Big Sammich': automation's multi-tool. This is a single hand tool that contains all the necessary individual hand tools used most commonly used in technical theater. It includes wire clippers, strippers and a crimper, quarter-inch driver bits, and a few other specialized hand tools for specific applications.



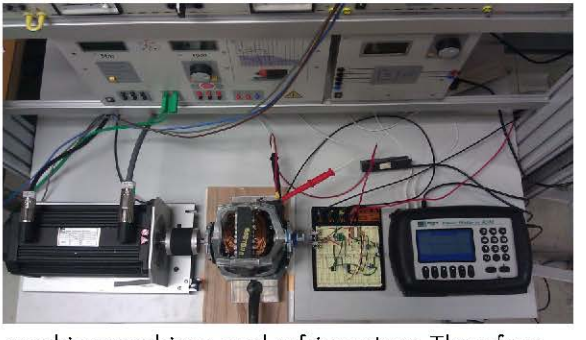
What makes this tool even more impressive is that it features detachable handles that contain a ratchet system. Another cool feature is the T-handle driver, to which the driver bits are attached. The T-handle provides a comfortable grip, and allows the user to apply more force on the driver with less physical effort on his/her hand. The Big Sammich comes with its own holster/pouch, where the quarter-inch driver bits are also stored.

This tool is not limited to the automation department. It is also useful to riggers, sound technicians, and electricians. Automation technicians work hard to make everyone's job easier. Now, the Big Sammich makes automation technicians' work a little bit easier.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 4:00 p.m.
Automatic Efficiency Optimizer
Department: Electrical and Computer Engineering
Project Team: Desert Energy Busters
Project Participant: Deep Patel
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Dr. Yahia Baghzouz

Abstract:
Single-phase, fractional-horsepower motors are generally designed to minimize cost and size. However, efficiency is largely ignored. Consequently, the efficiency of these motors is relatively poor. When not operating at maximum load, the efficiency of these motors decreases even further. Devices that can be connected externally to improve efficiency exist for three-phase multi-horsepower motors. However, no such device exists for single-phase, fractional horsepower motors.



Our project, the Automatic Efficiency Optimizer, aims to fill that gap by improving the efficiency of single-phase fractional-horsepower motors operating at changing loads. These motors – and, consequently, our device – have applications in various household equipment, including dishwashers, dryers, washing machines, and refrigerators. Therefore, improving the efficiency of these motors will help reduce electricity bills and improve lives of these household appliances.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

CS: First Place Winner

Time: 4:10 p.m.
GiftButler
Department: Computer Science
Project Participant: John Bertini
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
GiftButler is an iOS app designed to provide a new way for customers to receive gift recommendations for holidays, birthdays, and other events. Current gift recommendation apps and websites typically provide random lists of items with no rhyme or reason. Some may bother to divide their gifts into huge categories like "Mom", "Dad", "Son", etc. The problem with this is that everyone's mom, dad, or son is a totally different person. No overarching "Mom" category can ever cater to every mom out there. Anyone looking for gift recommendations specific to their loved one is out of luck. GiftButler is designed to fill this unmet need.

GiftButler allows customers to search for gifts on the basis of a four-category description of their loved one, save those searches, and add individual gifts to favorites for later viewing, all in a user-friendly iOS app. Gifts are taken from a curated database of selections suited to the individual's interests and character traits. These factors combine in GiftButler to provide customers a truly novel gift-finding experience.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

CEE: First Place Winner

Time: 4:20 p.m.
ZNE Portable Modular Building
Department: Civil and Environmental Engineering and Construction
Project Team: Here Today, Gone Tomorrow
Project Participants: Ryan Goerl, Paul McLandrich, Nick Natale, Jared Noa
Instructor: Dr. David Ashley
Faculty Advisor: Dr. Moses Karakouzian

Abstract:
Portable buildings can be found at school campuses across the country as a temporary means of combatting population fluctuation and overcrowding, without building costly permanent structures. Although these buildings usually are intended only for short periods of use, they are frequently used past their recommended lifecycle and become a permanent part of a school's infrastructure. Many of these buildings are uncomfortable and have inefficient heating/cooling systems and insulation that results in a poor experience for the students and teachers alike.

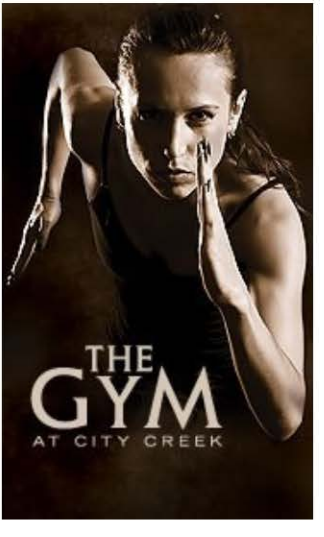
The goal of Here Today, Gone Tomorrow was to design a modern, energy-efficient, self-sustaining portable building that would provide students and other end-users with a more comfortable, innovative, and environmentally friendly experience than that of a standard portable building. To accomplish this task, the team proposed and evaluated several alternatives for each aspect of the building's design, specifically the foundation, structural design, transportation, fabrication, insulation, climate control, lighting system, multimedia demands, and power generation/storage systems. One of the more innovative aspects of the design is a sophisticated radiant heating and cooling system. This system provides the same capabilities as traditional HVAC systems, without noisy, antiquated components, and provides an energy savings of up to 70 percent. Additionally, a solar-powered generation system is capable of producing enough energy to achieve zero-net energy conditions or, in some instances, a surplus of energy that can be sold back to the municipal power grid and provide a stream of revenue.

Left to right: Nick Natale, Jared Nog, Paul McLandrich, Ryan Goerl

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

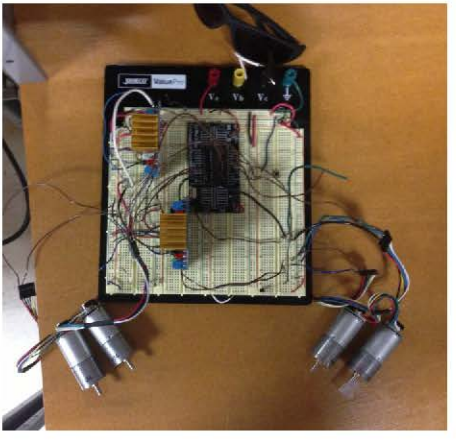
Time: 4:35 p.m.
The Gym at City Creek
Department: Computer Science
Project Participant: Jerrelle Marshall
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

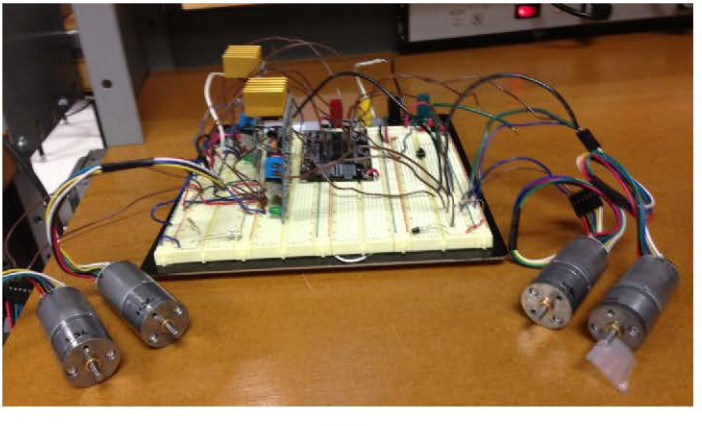
Abstract:
In this app we help the user to create an appropriate exercise program in order to help them stay in shape. We enable the user to keep a journal of each exercise, the time or number of repetitions, and the date and time of the day. We also point out the benefits of each type of exercise and recommend how it should be performed, how many times should be repeated, or for how long, in order to have certain desired benefits.



Time: 4:45 p.m.
Motor Machine
Department: Electrical and Computer Engineering
Project Team: Motor
Project Participant: Christopher Sikes
Instructor: Mr. Brandon Blackstone
Faculty Advisor: Mr. Brandon Blackstone

Abstract:
This circuit will utilize four DC motors, a sensor, and a start button. After the button is pressed, the first motor will spin clockwise, then pause and spin counter-clockwise, and then stop. After that, the second motor will start up and keep spinning until the sensor detects three items passing by. After this, the motor will stop; the third motor will spin, then pause; and then, the third and fourth motor will spin together and stop.





Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 4:55 p.m.
Mneumonic
Department: Computer Science
Project Participant: Alexander Felix
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
Good memory enables students to remember their reading materials and perform better in tests. It helps people in general to remember the tasks the have to do every day and utilize their time more efficiently. In this app, we present a method to improve people's memory. The method helps people associate names and other things in a way that it is easy for the human memory to retain.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

Time: 5:05 p.m.
Volkswagen Repair App
Department: Computer Science
Project Participant: Geordan Keller
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
Old model and new model Volkswagens are very common. I have developed an iPhone app that helps Volkswagen owners to diagnose problems, properly maintain their car, buy the proper tools for repairs, and buy quality replacement parts as needed at a reasonable price. This app allows them to form alliances with other Volkswagen owners to exchange ideas and get professional guidance regarding the repairs and maintenance of their cars, provide pictures of Volkswagen parts and the proper way to place them in the car, or replace them, and provide maintenance schedules for various models.

Senior Design Project Abstracts
Cox Pavilion
May 9, 2013

EED: First Place & Commercial Potential

Time: 5:15 p.m.
Music Page Assistant
Department: Entertainment Engineering and Design
Project Team: TeamSoloMid
Project Participant: Tim Lee
Instructor: Mr. Joe Aldridge
Faculty Advisor: Mr. Mike Genova

Abstract:
The Music Page Assistant is the answer to performance problems caused by unreliable page turners, as well as for any musician that uses two hands during a performance. During a performance, musicians rely on page turners to turn the pages of sheet music in order to avoid interrupting the piece while turning pages. Frequently, page turners either fail to turn the page efficiently or swiftly or else fail to turn the page completely, which may lead to an embarrassing performance. At the command of the user, by means of a foot switch, the Music Page Assistant device will transfer a sheet of music to reveal the next one in a smooth, seamless, and quiet fashion.

Using the same methodology as a printer, the paper is transferred from one side to the other by a system of rollers. Generally, the paper is transferred from right to left, just like reading a book. Occasions do arise where pages must be transferred from left to right, for example, repeats, da capos (D.C.s), and other types of navigational symbols. The device is capable of reversing input direction, leaving the right side as the new output destination.

The Music Page Assistant is a device that is long overdue, especially for musicians seeking the perfect performance, and who await an answer to the human page turner.

Time: 5:25 p.m.
Geology App
Department: Computer Science
Project Participant: Christopher Grant
Instructor: Dr. Evangelos Yfantis
Faculty Advisor: Dr. Evangelos Yfantis

Abstract:
During geology-related field trips, students are asked to recognize various rocks and what they consist of. Also, during hikes, often times one comes upon a rock with a peculiar shape and/or color and wonders what kind of minerals it consists of. In this app, we have a database that includes various types of rocks with their images, shapes, colors, and names. It also includes the material that they consist of, as well as if they are precious or not.

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