

INEL 5195 and ICOM 5047

YOU ARE CORDIALLY INVITED TO THE ELECTRICAL AND COMPUTER ENGINEERING DESIGN COURSE FINAL PRESENTATIONS

Capstone Groups

Coding Caciques

RUMbotics Tech

GreenDev

Shift Watchers

Presentations

On

May 7, 2014

- Oral presentations
- 9:30am to 10:45 am
- Stefani 113
- Project Demos
- 11:00am to 12:00pm
- Stefani 123

AGENDA

MAY 7, 2014

Stefani Building 113

9:30 AM - 9:45 AM

Team: Coding Caciques - Jesús E. Luzón, Anthony Llanos, Juan J. Lebrón, and Manuel E. Márquez
Project: AeroBal

Wind tunnels are used to study the aerodynamic characteristics of objects under the effect of air in motion. Characteristics studied include a number of physical quantities, such as drag, lift, and side. These are forces exerted by the air in three-dimensional space, one for each component. The tunnel at the University of Puerto Rico at Mayaguez, Department of Civil Engineering, uses a balance that mechanically measures these forces by manually using a scale to determine the amount of weight that counteracts these forces. Aerobal automates this process by implementing electronic sensors that obtain the environmental and force measurements. The user is guided through the experiment process with an application in a tablet, PC or web interface, and is presented with the measurements from the sensors. The experimental data is stored in a database and analyzed for the user to provide statistical analysis, data visualization, and results.

9:45 AM - 10:00 AM

Team: RUMbotics Tech - Héctor G. Acevedo, Zaylis Zayas, and Oscar González
Project: Eyes and Ears Implementation for Telepresence System

Our main objective is to provide an audiovisual system for the iRobot Create Programmable Robot. This audiovisual system will give the robot telepresence capabilities by providing the user with 3D video and multichannel sound at the user control station. This represents a beneficial impact for remote rescue applications. It will help rescuers fulfill their duties without exposing themselves to hazardous environment, as they can sense through their eyes and ears the robot's surrounding while controlling it from a safe remote location.

10:00 AM - 10:15 AM

Break

10:15 AM - 10:30 AM

Team: GreenDev - José R. Díaz, Víctor J. Reventós, and Miguel A. García
Project: Pragma

Pragma is a web application designed to provide irrigation management services to farmers. Additionally, it provides registered agricultural scientists access to Puerto Rico wide hydro-climate data. Primarily, Pragma provides farmers with the proper amount of water to irrigate their crops. This service is possible because Pragma keeps track of your crop's growth stage, irrigation history, your farm's geographical location, and collects the previously mentioned hydro-climate data daily from the GOES satellite and NEXRAD radar. Pragma employs agricultural engineering methodologies and algorithms for crop water requirement calculations. Pragma is available for both mobile and desktop use.

10:30 AM - 10:45 AM

Team: Shift Watchers - Yannick M. Taranto, Héctor E. Rivera, and Luis A. González
Project: Who's Here?

Shift Watchers is developing the "Who's Here?" application, an attendance system that can be accessed from a web or mobile device by supervisors in a manufacturing production line. This system will address a manufacturing company's concerns regarding the employee absence risk during a shift, such as the absence during important deadlines. "Who's Here?" will give the supervisor a system that can notify them the employees that are present, absent, or late. It will provide the supervisor with the adequate certified employees that can replace the absent employee. The supervisor will have the ability of selecting the right employee for a task instead of manually trying to guess who is certified. "Who's Here?" will also predict the probability of future absences by employees so that supervisors can better prepare before the employee is absent.

10:45 AM - 11:00 AM

Group Picture, Stefani Lobby

11:00 AM - 12:00 PM

Project Demonstrations in Stefani Building 123



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YOU ARE CORDIALLY INVITED TO THE ELECTRICAL AND COMPUTER ENGINEERING DESIGN COURSE FINAL PRESENTATIONS

Capstone Groups

Barefoot Electronics

Teia Engineering

CYNERJY

HKJ

Tech Trinkets

WLG

Presentations

On

May 8, 2014

- Oral presentations
- 10:30am to 12:00pm
- Stefani 113
- Project Demos
- 12:15pm to 1:00pm
- Stefani 123

AGENDA

MAY 8, 2014, Stefani Building 113

10:30 AM - 10:45 AM

Team: Barefoot Electronics - Javier J. Peña, Lyanne Magriz, Gerardo D. Guerrero, and Luis X. Alvarado
Project: Aquaculture Maintenance System

Our Aquaculture Maintenance System or AMS is the new automated solution for small aquaculture farmers who have to carry out practically all processes and tasks manually while breeding their fish crops. AMS provides the user with real-time oxygen and temperature readings letting the user establish the minimum parameters for the fish crops ideal living conditions and automated regulation processes for these variables. This system makes controlled use of solar heaters, electric valves and air pumps to reduce operational costs and also, provides the user with a battery powered backup energy system in the event of a power outage. AMS gives us the opportunity to boost aquaculture in Puerto Rico, reduce small farmers operational costs and help regulate environmental conditions necessary for ideal fish crop reproduction, therefore increasing profitability.

10:45 AM - 11:00 AM

Team: Teia Engineering - Rodolfo A. Flores, Derick Morán, and David Fernández
Project: AgroMesh

AgroMesh is a Machine-to-Machine (M2M) wireless sensor network that can provide farmers with information about the conditions of the plant and soil of a field. An AgroMesh setup consists of various solar powered measurement node deployed across a farm and an Automatic Weather Station. A user can connect to the network on site from any Wi-fi capable device to access the interface where microclimate conditions, soil moisture and UV radiation can be grabbed and analyzed. Using this information, two additional parameters will also be calculated: Downy Mildew and Growing Degree Days.

11:00 AM - 11:15 AM

Team: CYNERJY - Carlos D. Agüero, Nelmarie Morales, Juan G. Ocasio, and Ricardo J. Marrero
Project: H.Q.B. Mic. & App

The solution or product involves a microphone that will connect via Bluetooth to a specialized iPhone application with features such as: recording, editing, and e-mailing. All features of the application will be controlled with a simple GUI including switching between Bluetooth devices. The finished product will feature the specialized microphone and a downloadable iPhone application.

11:15 AM - 11:30 AM

Team: HKJ - Héctor Y. Franqui, Keishla Ortiz, and Juan P. Bermúdez
Project: SisCA

SisCA is a centralized parking access control system. SisCA will work using RFID technologies to identify tags placed on vehicles' windshields. The tags will contain information as to whether that particular vehicle is authorized to enter a parking lot. SisCA is composed of three components: an electronic device known as SAD, a software application known as CAS and an application server. The SAD devices contain the RFID module and logic to control a parking barrier gate. The CAS software will configure SAD devices and manage all logic regarding tag, parking and permission management. The application server will coordinate communication between CAS software and the SAD devices.

11:30 AM - 11:45 AM

Team: Tech Trinkets - Erick Caraballo, Susana C. Galicia, and José C. Rivera
Project: Trolley Tracker

Trolley Tracker seeks to eradicate the uncertainty of students while waiting for an UPRM "trolley" to arrive. Trolley Tracker is a near real-time tracking system that displays locations of operating buses in a Google Maps interface along with estimated arrival times for the next trolley bus on a given route to a user-specified stop. Tracking of buses is done through a GPRS/GPS-enabled embedded unit that sends location updates to a remote server. Trolley Tracker's application can be accessed through web browsers in PCs or smartphones without the need to submit credentials. In addition, it will allow UPRM's administration to display service interruption announcements so that users of this transportation system can make arrangements accordingly.

11:45 AM - 12:00 PM

Team: WLG - Leonardo Ortíz, Francisco L. De Choudens, Derick Meléndez, and José L. Acevedo
Project: Mappaleo

Mappaleo is a mobile application that can actively supply the visitors of the Mayaguez Zoo with information relevant to the specific exhibit they are viewing directly to their smartphones. The system is also capable of guiding visitors to any points of interest within the zoo using interactive maps. The application will use GPS to locate the user and present the correct information in open spaces while iBeacon technology will be used in enclosed spaces where GPS is not available. This solution is specialized for the Mayaguez Zoo but the technology is applicable to other venues.

12:00 PM - 12:15 PM

Group Picture

12:15 PM - 1:00 PM

Project Demonstrations in Stefani Building 123



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Capstone Groups

Hydra

Contronics

Greentronics Automation

gTech

Abysmal Solutions

RAD Solutions

Presentations

On

May 9, 2014

- Oral presentations
- 9:30am to 11:00am
- Stefani 113
- Project Demos
- 11:15am to 12:15pm
- Stefani 213 & 123

AGENDA

May 9, 2014, Stefani 113

9:30 AM - 9:45 AM

Team: Hydra - Raúl A. Alvarado and Charlie J. Feliciano

Project: Temperature Regulator for Water

Plants growth can be affected by a variety of environmental factors such as temperature, moisture, and light, among others. The temperature of the water used to irrigate the plants must be within a safe range or it could make them susceptible to pests. We will build a device capable of automatically monitor the temperature of the water and exercise the proper control to maintain the water inside the tank at the desired range. Our goal is to provide local farmers with a solution to this problem in order to help them reduce their losses due to wasted crops and therefore increase their profits.



9:45 AM - 10:00 AM

Team: Contronics - Iván J. Rodríguez, Carlos G. Bolivar, and Nomar S. González

Project: Solar Powered Water Pumping System

Solar energy solutions to common industrial and household applications such as water pumping are continually growing in demand. These applications are particularly important in tropical areas such as Puerto Rico due to an abundance of solar energy during most of the year. Solar Powered Water Pumping System by Contronics provides the capability of eliminating Grid dependence in order to operate a water pump and automates system irrigation. MPPT algorithm and controllers will be implemented on a microprocessor for maximum power transfer from solar panels. This application is custom made for our client but it can be modified for residential photovoltaic systems.



10:00 AM - 10:15 AM

Team: Greentronics Automation - Ivonne Pérez, Jesús Muñiz, Luis O. Hernández, and Orlando Santana

Project: Greentronics

Greentronics is an automatic irrigation system that eases hydroponic crop maintenance by dispensing a preselected chemical dose of fertilizers and pesticides. A human machine interface (HMI) will be used to select type of product, configure periodicity of irrigation, add and configure new fertilizers or pesticides to the system, and start cleaning cycle for the irrigation system. In addition, a programmable logic controller (PLC) will coordinate the timing of valves, DC motors and sensors.



10:15 AM - 10:30 AM

Team: gTech - Carlos Oliveras, Luis Méndez, and Erick Marrero

Project: Smart Irrigation System

Everyday organic food products interest increases over time as people look for healthy lifestyle naturally. Organic products market is growing in Puerto Rico and our focus is to optimize the production for small size farms. This project is focused in the design of a Smart Irrigation System that will take care of an organic orchard providing water and fertilizer only when it is really needed. The Ebb & Flow irrigation technique used in our system will save over 50% of water usage while reducing indirectly the chances of pests development in plants. The system will be activated by the lack of moisture in the soil. The process control will be performed by an embedded system allowing the farmer to schedule fertilization cycles through the week using a Human Machine Interface.



10:30 AM - 10:45 AM

Team: Abysmal Solutions - Eduardo G. Rodríguez, Jesús R. Torrado, and Javier R. Rivera

Project: AMPHERES

AMPHERES, a fault-tolerant deep-oceanic free vehicle, is a solution to the oceanographers and marine scientists research community, bringing a low cost delivery system and providing an efficient way to transport oceanographic instrumentation to the sea floor or trenches. The system gathers information about the internal state of the vehicle, such as temperature, pressure, humidity and acceleration. It also logs this data into a microSD card for further analysis. To recover the system, a strobe light and RF transmitter will be incorporated to pinpoint the system's location while on the surface. Also, an application is provided to configure mission parameters, run diagnostics, extract/delete data from the microSD, and begin a deployment.



10:45 AM - 11:00 AM

Team: RAD Solutions - Zemuel A. Román, Manuel R. Saldaña, Amado A. Gómez, and Christian Barrientos

Project: Fleetbooks

Fleetbooks will be a software system that will allow construction companies to manage their heavy equipment fleet data, access it from anywhere, and create business reports using that data. This will help them reduce the costs currently incurred in this process while raising their employees productivity. The companies will be able to track the equipment's location in their projects, daily usage, fuel consumption, and keep track of when the equipment needs routine maintenance performed. The system will be maintained through a web application and a mobile application will be developed that will enable company employees to access the fleet data at any time.



11:00 AM - 11:15 AM

Group Picture

11:15 AM - 12:15 PM

Project Demonstrations in Stefani Building 213 & 123