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# enVISION

University of South Florida | College of Engineering

## PEACE CORPS Master's International Program in Civil and Environmental Engineering

A dead cow is discovered in a ditch in the Dominican Republic. This ditch is for pipe that will provide safe drinking water to a village, the work managed by a Peace Corps student in the Master's International Program. Enraged, the cow's owner has the hapless student thrown into the fetid rural jail.

On the day of the trial, the student is brought before the judge, where the angry land owner itemizes his loss of income, sustenance and reproductive capabilities of the unfortunate bovine to a packed courtroom. The student contemplates his short life, and what it would have been like to have taken that lucrative position in the corporate world.

One by one, the people in the room come forward. Recognizing his own villagers, the astonished student listens as they defend him and his efforts to bring clean spring water via a pipeline to their village in the valley. The judge weighs the considerable loss of one cow against the testimony of the people. He releases the student. Now clean water flows through the pipeline, safely buried, to the village in the valley.

In 1997, **Dr. Jim Mihelcic** founded the Master's International Program in Civil and Environmental Engineering. Currently the Director of the program at USF, Dr. Mihelcic uses the dead cow incident to underscore the major goals of the Master/Peace Corps program: to deliver economic, environmental and social benefits to developing countries. "The people in this village took ownership of the project," said Dr. Mihelcic. The economic gravity feed of the pipeline, the improvement in the water quality and the sensitivity to the social structure of the people involved created a sustainable and successful engineering project.

### The program is simple:

after successful acceptance and country placement by the Peace Corps, the student spends one year on campus with coursework in engineering, sustainable development technology, global public health and applied anthropology. Then, 3 months of training and two years of service abroad as a Peace Corps Volunteer doing engineering work related to his or her specialty. During those two years the student also fulfills the requirement of identifying and completing a research thesis, thus, creating knowledge to assist others. Extensive information on specific academics, application processes and student biographies is available at: <http://cee.eng.usf.edu/peacecorps>.

### This is not your father's Peace Corps.

Students get real-world engineering experience. But the engineering will be defined by sustainability, appropriate technology and sensitivity to the social and economic needs of

the people. In many parts of the world, hauling water is the job of women. Some factors to consider are distance to the water source; and type of containers they use; and can these containers fit under the spigot; and will standing water attract insects; and is laundry done in the area. Researching and applying the appropriate technological and social solutions to serve humanity, and creating knowledge from these experiences, is all part of this global challenge.

Distribution of Master's International students is roughly one-third Sub-Sahara Africa, one-third Central and South America and one-third Pacific Rim such as Samoa, Fiji and the Philippines. There are already 24 countries benefiting from this program. Students enrolled at USF are provided training unique to their placement country. For example,

*continued on p.2*



*The Republic of Mali is a land-locked French-speaking nation in Western Africa. Top left, clockwise: USF student Brooke Ahrens standing near a water pump in Sirakorobougou, a typical project in this program; Hygiene mural, serves as a community reminder; A traditional Mali well; Dr. Jim Mihelcic, program founder*

COVER PHOTO—taken during the International Capstone Design project at Tierras Nuevas, Bolivia. Provided by Linda Phillips, lecturer, Civil & Environmental Engineering.

environmental and economic aspects of small islands are very different from large landmasses.

While the interdisciplinary approach to the Master's program is not new, the quest for sustainable development is a driving force. "There are some grand challenges to be faced," says **Dr. Maya Trotz**, one of faculty management team for the project. "Collaboration across fields, the Internet, funding, and working with such entities as NOAA on climate change, all of these are pressing issues." Growing up in Guyana, Dr. Trotz believes in a holistic approach in providing engineering solutions, and specializes in arsenic removal from groundwater.

"Some of my students have remained in-country and work in non-governmental organization capacities," said Dr. Mihelcic. "Eight continued into Ph.D. programs and one works on Capital Hill and is also in law school. In this country, I have an Indian health services worker specializing in water sanitation, and many students are engineering consultants, some even working on the restoration of the Everglades. The strong technical skills and the social component develop a world focus. The applied engineering professionalizes the experience, and the human dimension is transformative."

Students in this program use Dr. Mihelcic's *Field Guide in Environmental Engineering for Development Workers: Water, Sanitation, Indoor Air*, (ASCE Press, 2009). In the foreword, President Jimmy Carter expresses the ideals of this program: "Having access to the basic needs of water, sanitation, hygiene and shelter are issues of human rights, not just issues of development and engineering." The faculty, mentors and students of the Master's International Program share this philosophy and make their experience and education available to benefit the most vulnerable members of humanity.

For more information, please contact Dr. Mihelcic at [jm41@eng.usf.edu](mailto:jm41@eng.usf.edu) and Dr. Trotz at [matrotz@eng.usf.edu](mailto:matrotz@eng.usf.edu).



Top right: Students and Mali residents work on new well project  
Bottom right: Completed well

## Our Vision Drives Us

Sit down, grab your favorite beverage and dig in! Like families that are far too long apart and distant, the time for our family reunion is long overdue. The University of South Florida College of Engineering is in its 45th year of service to our students, the state of Florida and the broader community.



Dean John Wiencek

As with many 45 year olds, we have spawned a large family. Some are close to home and others, perhaps even you, have moved on to distant places to seek their destiny. I am so pleased that we are finally able to reach out to you and to update everyone on our family's success and growth. As you start turning the pages, you will gain an appreciation of the breadth and impact of our family. We have faculty and students in the far reaches of the world bringing water and a more modern standard of living to people. You will see what we are doing about energy needs of the world. Learn how going green makes green. Celebrate our successes, from CAREER awards to Outstanding Staff Awards. Hear about your classmates and our proud traditions such as Bull-Arney and the Heart of Gold Scholarship Luncheon. It has been awhile, we have much to share.

In addition to our own 45th anniversary, the year 2009 marks the 200th anniversary of Charles Darwin's birth. Darwin's Theory of Evolution plays out in many arenas besides the natural world. Even organizations have a continual evolution, and here at USF College of Engineering

things continue to evolve. You may be wondering about the name and what has happened since the days of the Bridge Builder newsletter. Well, I can assure you that, at the heart, all that you are fond of remain. But things have continued to evolve. The College community made a conscious decision under Dean Martin-Vega, my predecessor, to seek a newsletter name that captured a breadth of disciplines beyond the implications of the Bridge Builder

name. The USF Engineer was published for several years as a result. The stress of the economy and a difficult transition in the Dean's office has resulted in a two-year lapse in our newsletter. It was time to reassess where we are, and what we embrace going forward. There has been ample discussion in the halls of Kopp Hall and the newly named Burdick Hall about the College's logo and newsletter name. USF Engineer was one of several ideas under consideration. After much discussion, we landed on enVision. The capital V is intentional. We are Bull engineers and scientists with vision. We are humble team players, knowing that the vision is what is most important. Our engineering and scientific skills serve us well, but our Vision drives us.

I am relatively new here at USF, but no longer a newcomer. The last two years have been rough on all of us—both here at USF as well as our broader USF family throughout the country. In times like these, it is all the more important that we seek the solace and rejoice in the triumphs of our family. I encourage you to please share your news with us. We need to hear from you.

## enVision

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Editor	Janet Gillis
Designer	Wendy Teague
Writers	Janet Dawald Janet Gillis

### MISSION STATEMENT

The mission of the College of Engineering at the University of South Florida is to improve the quality of life in our community by providing a high quality education for our students and practicing professionals; by creating new knowledge and solving real world problems via innovative research; and by engaging in effective community service and outreach.

To be added to our mailing list or for more information, contact:

Janet Gillis  
Communications and Marketing Officer  
College of Engineering  
University of South Florida  
4202 E. Fowler Ave. ENB 118  
Tampa, FL 33620  
email: [janetgillis@eng.usf.edu](mailto:janetgillis@eng.usf.edu)



## Cognitive Radio— Intelligent Wireless Networking Saves Lives

**D**uring Hurricane Katrina, thousands of cell sites were knocked out of service by the hurricane, and land lines and switching centers were disabled from floodwaters. The sustained loss of electricity ensured that surviving facilities running on generators eventually ran out of fuel. In New York, on September 11, 2001, various first responders used radio communications that were incompatible with other responders. The most effective system used by the Port Authority had been disabled when the repeaters, placed in each of the Twin Towers, were destroyed when the buildings collapsed. Overwhelming cell phone traffic led to crashes of the entire East Coast cellular network.

How does cognitive radio fit into this picture? In the not-too-distant future, cognitive radio and networking will replace current radio devices that need fixed infrastructure and use only specific radio frequencies. Instead, smart radio devices will detect each other's transmissions and adjust their capabilities accordingly. A collection of cognitive radios would build a wireless ad hoc network whenever necessary, without

the need for nearby infrastructure. These devices would be programmable to suit their environment, the user's requirements and be able to utilize whatever radio frequencies are available at the time.

**Dr. Hüseyin Arslan**, an associate professor of electrical engineering, sees the future now. "Slowly the intelligence is going into the radio devices. When this happens communication will be I-centric – the user will have the power and control, not the network. So we will have less functionality in the network and more functionality in the user. And the user will be able to communicate with all the devices around it, even if there is no real network out there."



"These radios would work together and configure themselves immediately," Dr. Arslan explains. "They can adapt to a given situation, including the network that they prefer to operate, the distance between transmitter and receiver, the used waveform, the available bandwidth and operating frequency, the required data rate, the remaining battery power, the user requirements, and the environment that the radio is operating. Also, they can find an intermediate device to use as a relay in multi-hopping schemes."

Another interesting application of cognitive radio can be considered as the vehicle-to-vehicle and vehicle-to-roadside communication, reminding us of the old TV

series "Knight Rider." Theoretically, any car equipped with a radio can interact with every car in the vicinity. Now, this is not for the drivers to carry on conversations, but for traffic control, maintaining distances between vehicles, alerts for accidents and even to take over control of the braking system of a car if the driver does not respond soon enough.

The number of wireless applications per person in the world is staggering. It is estimated that 80 percent of the world's population has access to wireless devices. These devices include cell phones, machine-to-machine communication, sensor communication and telemetry. Is there enough radio frequency bandwidth to go around? "Actually we don't have a spectrum problem," Dr. Arslan says. "Our problem is the inefficient usage of the spectrum, and how we have assigned frequencies in the past. The FCC is slowly changing the rules. One example is opportunistic spectrum usage. If a detected frequency is not utilized by the primary, or owner of the frequency, then the smart radio device can be a secondary user, and be able to grab that frequency."

The USF College of Engineering is one of the leading institutions in the development of cognitive radio technology. Imagine what the outcomes of Hurricane Katrina and 9/11 would have been if there had been reliable radio communications during these disasters. In the next 20 years, this technology will have a large impact on our safety, society and economy.

## VIRTUALMD

If you are a fan of the *Enterprise's* Holodeck, the VirtualMD Lab is a wonder of 3D modeling, prototyping and futuristic medicine. **Dr. Susana Lai-Yuen**, assistant professor with the department of Industrial and Management Systems Engineering, works with state-of-the-art equipment to produce both virtual and real medical devices. Even Dr. McCoy would be amazed at the collection of three-dimensional scanners and printers, robots, CNC machines and the sheer computing power necessary to run this equipment.

The primary focus of the VirtualMD Lab is partnering with the medical community to improve or create medical devices. Experts in engineering and medicine collaborate with students and faculty to provide experience in all areas of research, development, manufacturing and physical use of medical devices.

Truly an interdisciplinary approach, a recent project involved the creation of a new surgical tool. **Dr. Stuart Hart** from the College of Medicine described the need for a new device to assist in minimally-invasive surgical techniques. The students observed the actual operation, and then used 3D modeling and rapid prototyping equipment to design and create a prototype.

For two days each February, the lab opens its doors during Engineering Expo. "We have a virtual 'rubber duck' for the children," Dr. Lai-Yuen explains. "It is made in virtual clay, and they can add or remove material, paint it and add hair." Part of this process involves the use of haptic devices, which is the interface between human touch and a machine. These devices impart forces or motions to the user. With them you can actually feel the clay being scraped off the virtual duck. It is fascinating to see what children come up with."

The projects vary from a USF bull-shaped iPod to improved cell phone design. "Sometimes I make the design open-ended, with the only constraint being the working area of the prototyping machines," explains Dr. Lai-Yuen about the kinds of projects created. However, because of ongoing commercial development, some products cannot be discussed. "Many of our medical devices are still in the process of being patented," says Dr. Lai-Yuen.

The Virtual Lab is sponsored by the College of Engineering at USF, the Society of Manufacturing Engineers (SME) Education Foundation, the Center for Applied Research in Medical Devices (CareMed), and the Florida Medical Manufacturers' Consortium, Inc.

Sinan Önal, left, graduate student, and Krystal Foutner, undergraduate student, work on computer modeling in the VirtualMD Lab.

# Researchers Work on Renewable Energy Solutions

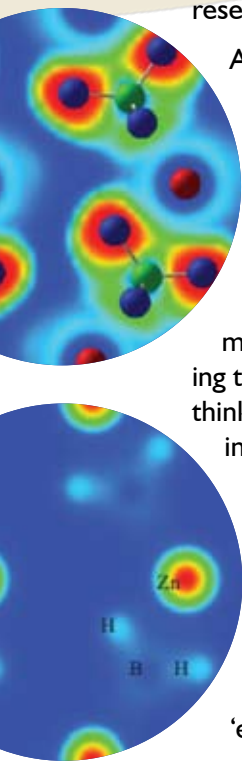
The Florida Energy Systems Consortium (FESC) is the collaboration of 11 Florida universities. **Dr. Yogi Goswami**, Professor of Chemical and Biomedical Engineering, is USF's contact for this project. These universities will be charged with sharing energy-related expertise and assisting in the development and implementation of a comprehensive, long-term, environmentally compatible, sustainable and efficient energy strategic plan for the state.

USF is proud to announce two projects in this area: **Hydrogen Fuel Storage Technology** and creating **Clean-burning Fuels** from Florida's agricultural biomass waste. Also, **Dr. John Kuhn** has joined the Chemical & Biomedical Engineering Department. Dr. Kuhn received his Ph.D. in Chemical Engineering at Ohio State in 2007. John's focus will be on alternative and sustainable energy. His specialty is nanostructured metal and metal oxide materials for energy applications including fuel cell electrocatalysis and catalytic fuel processing.

## Hydrogen Fuel Storage Technology—Testing Complex Borohydrides for Reversible Hydrogen Storage

One of the most complicated chemical processes for hydrogen-powered vehicles is the storage of hydrogen gas. Materials must be efficient, lightweight, economical and renewable. That's a tall order in the chemical engineering world, but two researchers from USF are serving it up.

A number of promising borohydride storage systems for the hydrogen have been studied in the past, according to **Dr. Venkat R. Bhethanabotla**, dept. chair. The systematic study of zinc, manganese and multinary borohydrides has led to testing a new complex borohydride—lithium manganese borohydride. Instead of storing the hydrogen in a tank (as most people think), it is stored on the molecular level in a solution and is converted to gas when required. Once the solution is depleted of its hydrogen, it must be economically *reversible*, or capable of being recharged with new hydrogen. In this scenario, you would pull up to the hydrogen "pump" and unload your spent borohydride, and then fill 'er up with the recharged borohydride.



**Pabitra Choudhury**, doctoral student, who specializes in computational chemistry, uses theoretical techniques for studying the various borohydrides for fuel cell use. "We believe that borohydride materials could be very promising energy storage because of their high theoretical capacity as well as light weight and reversible capability."

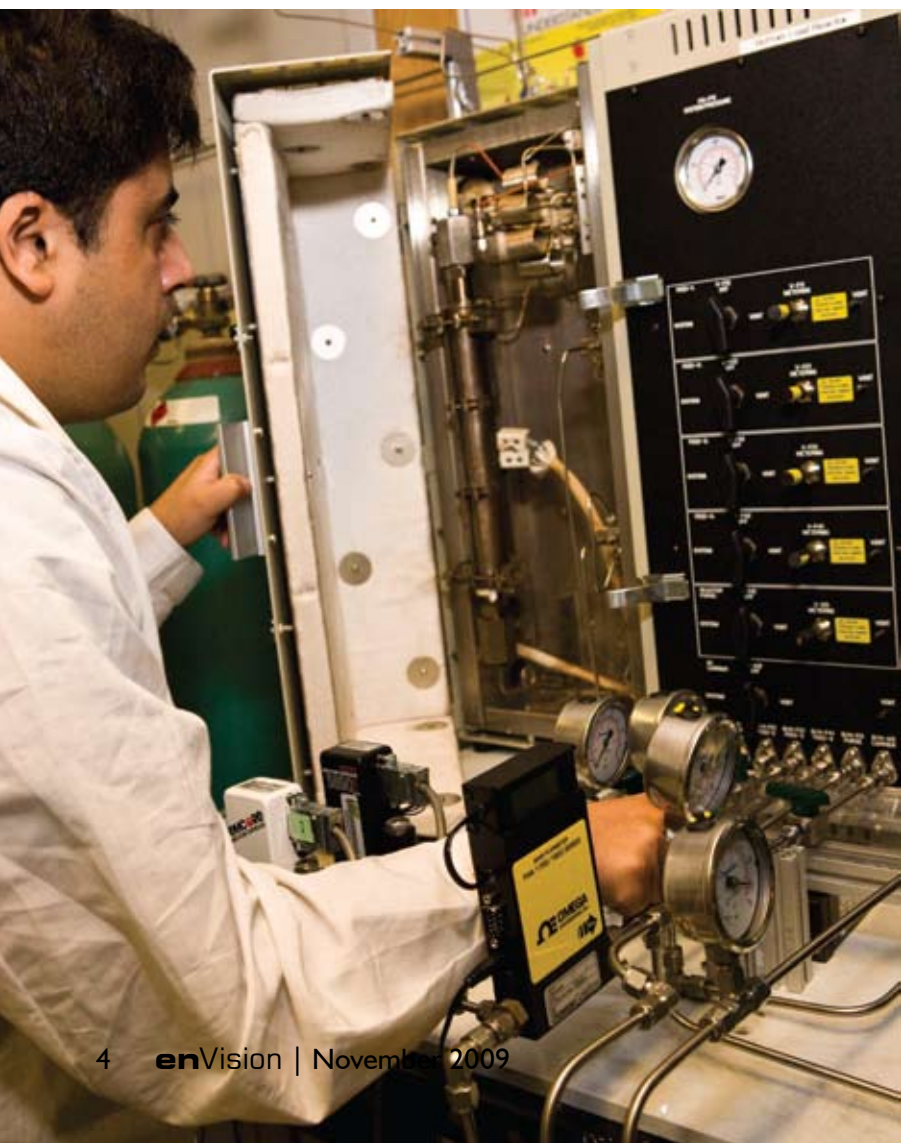
## Clean-burning Fuels—One Day Your Car Might Run on GRASS

Florida is the largest producer of biomass in the country. Fortunately, USF chemical engineers are improving the process of turning this huge amount of biomass into clean-burning liquid fuels. Abundant supplies of bagasse from the sugar industry, citrus peels and native pine, switch grass and municipal yard waste create a lignin-rich biomass that can be transformed by two processes: fermentation or thermochemical. Fermentation, as every wine or beer maker knows, is a biological process that is slow, difficult to control and expensive. So researchers at USF are focused on the thermochemical method. This process first converts the partially oxidized biomass to syngas (a gas mixture of carbon monoxide and hydrogen). The syngas is then converted to clean-burning liquid hydrocarbon fuels such as gasoline, diesel or even aviation fuels. This conversion process, the

Fischer-Tropsch Synthesis (FTS), was developed in Germany during the 1930's to use coal as a feed stock. The biomass FTS process involves a gasifier and catalyst, which must be fine-tuned for the specific biomass used in Florida. Minimizing pollutants while maximizing energy production and environmental considerations are also an integral part of this program. This renewable energy process will take advantage of Florida's unique and abundant supply of biomass. Establishment of this technology will create job opportunities and reduce the need for imported oil and gasoline.

Principal Investigators: **Babu Joseph, Yogi Goswami, Venkat Bhethanabotla, John T. Wolan, & Vinay Gupta**

*Left: Doctoral student Ali Gardezi works with the bench scale plug flow reactor in Dr. John Wolan's biomass lab.*



# 37 Faculty Inducted into Academy of Inventors

College of Engineering faculty members comprise 28% of the charter membership of the USF Academy of Inventors at the inaugural luncheon on October 5.

At the event, **Dr. Ken Christensen**, professor of computer science and engineering, received a 2009 Excellence in Innovation Award. Ken was nominated by **Dr. Larry Hall**, chair of the computer science and engineering dept., for his research that has resulted in innovations that reduce energy usage for computers and networks. Dr. Christensen's research, funded by NSF for four years and one year by Cisco, includes two key standards adopted by the EPA Energy Star Specification for Computers.

**Dr. Thomas Wade**, professor of electrical engineering is president elect of the 2009-2010 Executive Committee and **Dr. Thomas Weller**, associate dean of research, is a board member. **Dr. John Wienczek**, dean of the college of engineering was presented as an honorary charter member of the Academy.

### CHEMICAL / BIOMEDICAL

Venkat Bhethanabotla  
Richard Gilbert  
Yogi Goswami  
Vinay Gupta  
Mark Jaroszewski  
Aydin Sunol

### CIVIL & ENVIRONMENTAL

Stanley Kranc  
Gray Mullins  
Daniel Yeh

### COMPUTER SCIENCE & ENGINEERING

Kenneth Christensen  
Dmitry Goldgof  
Srinivas Katkoori  
Miguel Labrador  
Les Piegł  
Nagarajan Ranganathan  
Sudeep Sarkar

### ELECTRICAL

Shekhar Bhansali  
Kenneth Buckle  
Larry Dunleavy  
Christos Ferekides  
Richard Gitlin  
Andrew Hoff  
Vijay Jain  
Ashok Kumar  
Don Morel  
Wilfredo Moreno  
Stephen Saddow  
Rudy Schlaf  
Elias Stefanakos  
Thomas Wade  
Thomas Weller

### INDUSTRIAL & MANAGEMENT SYSTEMS

Tapas Das  
Geoffrey Okogbaa

### MECHANICAL

Glen Besterfield  
Nathan Crane  
Daniel Hess  
Stuart Wilkinson



# Is it Really GREEN or just Marketing?

**W**hat can your humble dishwasher tell you about being green? Once considered an extravagance of electricity and hot water, can a dishwasher point the way to sustainability? Enter the laboratory of **Dr. Delcie Durham**, professor of mechanical engineering, for an applied lesson in cutting through the, ah, grease and getting down to the shine.

Three issues determine if a product or system is sustainable: societal, cost/economics and environmental impact.

The societal factor ranges from meeting the needs of developing countries to what is marketable and what will sell in a given society. "Sustainability is always collaborative across many disciplines and expectations. It involves public health, anthropology, sociology and other's feedback that I cannot do without," states Dr Durham. "Sustainability is always transdisciplinary."

"I look at the cost and environmental impact. What I choose to use in terms of materials and processes to produce a product, and what kind of resources are going to be used while the product is used, and then what is going to happen at the end-of-life with the materials in that product. This is the total product lifecycle. The impact and costs are associated with material, energy, water and waste." For the metals in our dishwasher, databases now provide embedded environmental costs for every pound of steel, aluminum, copper and lead. Not only the dollar cost, but the environmental costs to mine, refine and mill the metals.

The next generation of databases will provide process information. What are the ramifications of coating the steel with porcelain? Coating the trays with plastic? In

the future we will have both the imbedded cost for the steel and the additional environmental costs for coating the interior with porcelain or plastic or other materials. This is the core concept of sustainability, knowing entire environmental impact of raw materials, manufacturing processes and distribution.

Manufacturers claim that costs will go up. Dr. Durham responds, "For those who are changing, this is a win/win situation, the triple bottom line" (accounting for ecological and social performance in addition to financial performance). For example, waste. Not only do sustainability practices reduce waste, they reduce the actual monetary cost of disposing of that waste. And some company's waste can be transformed into feedstock for another industry, sometimes at great profit. And if you do "go green" you market that and take it to the bank.

Now we can determine the environmental issues in manufacturing our dishwasher, but what about the energy and water consumption during the use of the appliance? "This is where sustainability is creeping into thinking about the dishwasher", says Dr. Durham. The evidence is the bright yellow EPA Energy Star sticker. The cost associated with running a new appliance is now readily available to every consumer. In addition, engineers use the concept of "exergy" when evaluating a product for energy efficiency. Exergy can be thought of as "useful work." The engineer knows that heat is useful to run the dishwasher, so how do I eliminate useless heat loss? Exergy also involves something as basic as knowing when to stop washing dishes. Does your old dishwasher always work for 30 minutes,



regardless of the fact that the dishes were probably clean in half that time?

Wait, that means my dishwasher has to "know" when the dishes are clean. This concept is called "resources on demand" and involves sensors or devices that can determine when to shorten or lengthen a given task. One dishwasher that Dr. Durham's team investigated had this sensor. However, that unit cost three times the price of the average dishwasher. It was, however, the most efficient over the total life cycle.

So now your older dishwasher has washed its last load. Sustainability looks at the total lifecycle of the dishwasher, how much can be recycled, reused, or needs to be land-filled. This is called "end-of-life." Obviously the steel parts are candidates for recycling, but are you going to dismantle it? (Well, maybe you have already tried this). If it was designed to be recycled in the first place, the manufacturer might be very happy to collect several hundred pounds of quality steel. (In some countries, recycling is the responsibility of the manufacturer, known as "take-back" laws.) In a truly green product, end-of-life is designed into the product, not into the dump.

In addition to the three issues of societal, economics and environmental impact, the concept of sustainability also involves evaluating existing models and redesigning selected components. Ideally, for every product there would be a set of rules, or blueprint that incorporates sustainability from start to finish.

So, load up your current white, black or stainless steel dishwasher and press "Start" because someday it will be green.

## DCI Solutions Builds an Ark

**E**brahim Mehrani, Ph.D., PE, SI, CGC, CCC, CBI, principal of DCI Solutions, Inc., is constructing an ark-shaped building that will house a restaurant and retail store containing approximately 6,000 sq. ft. under roof and 3,200 sq. ft. of open air area. This is a unique structure with a complex construction technique. In addition to the restaurant and retail space, there is an outdoor eating deck, a miniature golf course and driving range. Dr. Mehrani is a USF alum, B.S. and M.S. 1977 and Ph.D. 2005.

*Right: DCI Solutions Ark being built along I-4 near Dinosaur World*



## Engineering, Real Life, Soccer and Legos

The Research Experiences for Undergraduates (REU) program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. A more accurate description is “hands-on participation in cutting-edge engineering in the scientific process in an international networking environment with great pay.”

This past summer the students specialized in robotics. Using the Lego Mindstorms NXT robots, the challenge was to program them to play soccer. The students started from scratch, including robot construction, cameras, sensors and programming. **Dr. Miguel Labrador**, associate professor of computer science and REU coordinator divided the students into two teams; one graduate student to three undergraduates. On the day of the match, “We had some issues. The light and space in the open area of Engineering II was different from the lab. The robots are programmed to respond to light and color, and the new surroundings caused some confusion in the robotic soccer players. To be on the safe side, the students had programmed the robots to use a red soccer ball, making it easier to identify.

“Then we had far more journalists and spectators than we anticipated,” Dr. Labrador continues. “The flash on one photographer’s camera created a red light which drove the robots crazy. Then a spectator wore a red dress which was the same color as the soccer ball.”

The summer’s programs are selected in January by the department. He recruits students from many campuses in the United States, Puerto Rico and South America. The main idea of this program is to give students real research experience to determine if they like it or not, so they can make an informed decision about their education. Hopefully they will go on to graduate school. Several of the students in the first and second year of the USF program are now in Ph.D. studies.

The department of Computer Science and Engineering’s sixth summer session in 2010 is May 30 to August 6, and the deadline for applications is March 15. Part of the 10-week program includes housing at USF, transportation reimbursement and a \$4,000 stipend. Aimed at juniors and seniors from higher education institutions lacking world-class research facilities, this program actively recruits women and minorities.

If actual applied experience is not enough, there is more. Speakers are brought in on a range of topics from personal finance to experts in the engineering field. Networking with professors, graduate students and industry representatives provides incalculable benefits. “And, we also have fun, Dr. Labrador adds. Check out the schedule page on the website (<http://www.csee.usf.edu/REU>). You will see there is something new every week.”

Despite the distractions, the soccer competition was fierce, and the three undergrads beat the grad student four goals to one. “There was another important lesson here,” adds Dr. Labrador. “The graduate student’s strategy was complicated, and he ran out of time implementing it.” The trio of undergrads won with a more simple approach. Talk about your real world engineering experience!

The REU program is a rich and rigorous ten weeks. The REU website has all the information and application forms available. Be sure to check back early next year to see what the project for 2010 will be. “This is such an excellent opportunity,” said Labrador. “I wish I’d had these opportunities when I was a student.”

For more information contact Dr. Labrador, [labrador@eng.usf.edu](mailto:labrador@eng.usf.edu).

*Below: REU students, Kenneth Samuel Mendoza (left) and Abimilex Reveron prepare their robots for the soccer match.*



## Travel Assistance Device Provides Mobility to Disabled

What do a city bus, Google, and 911 have in common? Add a few more ingredients: enthusiastic researchers, visionary government employees and dedicated transit workers. The terms “interdisciplinary” or “collaboration” do not begin to cover the amazing development of the Travel Assistance Device (TAD). This revolutionary system helps disabled transit riders travel on city buses by providing real-time directions from their cell phone.

Under the working partnership between USF’s Center for Urban Transportation Research (CUTR) and Computer Science and Engineering, sponsorship and encouragement by the Florida Department of Transportation (FDOT) and U.S. Department of Transportation, donations of phones and service from Sprint-Nextel, and cooperation with the Hillsborough Area Regional Transit (HART), this program has been successfully tested in the Tampa Bay area. TAD is now in the process of being tested and evaluated with five other transit providers. The TAD project has also attracted interest from over 50 transit agencies around the U.S. as well as organizations in Canada, England, and Spain.

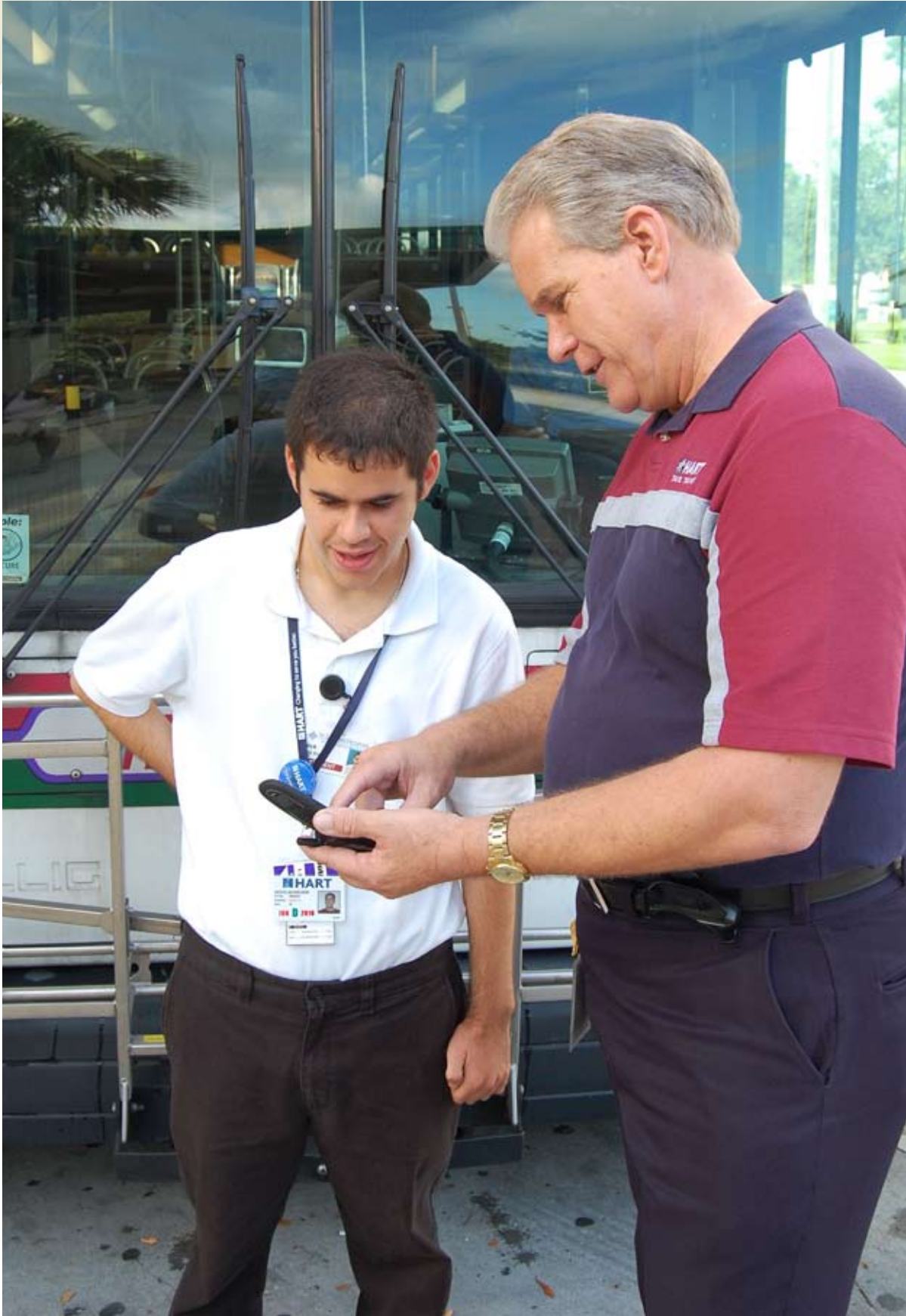
First, some history. A few years ago, the Federal Communications Commission mandated that 911 cell phone calls must include their position so they can be located by emergency responders. This led to Global Positioning System (GPS)—enabled cell phones. At Google, a project for gathering all the bus routes in the U.S. was underway. This project incorporates the bus routes of participating transit companies into the Google Map system. Within this project, Google standardized the interface (Google Transit Feed Specification, or GTFS), wherein the transit companies would submit their bus schedules for Google to upload and maintain within their map system. Today, you can see the results of this project when you plan a trip on Google; you will see a drop-down that offers the trip by car, by public transit, or by walking.

Enter **Amy Datz**, the visionary FDOT project manager who forwarded a *St. Petersburg Times* article to the CUTR researchers. In it, **Mark Sheppard**, talks about his job as a travel trainer with HART and helping individuals with disabilities travel independently on the bus. At the time, CUTR happened to be working on software applications for GPS-enabled cell phones. “We thought this was something we could potentially help with,” says **Sean Barbeau**, Research Associate at CUTR. “We talked with Mark Sheppard and began communicating with educators and other researchers that work with individuals with cognitive disabilities or special needs. From there, the idea grew into a proposal that attracted the interest and support of then Florida Secretary of Transportation **Denver Stutler**, and funding was obtained from National Center for Transit Research at CUTR. We were off and running.”

The CUTR researchers then faced the same challenges as Google—loading and updating thousands of bus schedules from transit agencies all around the country in order to create a nationally-deployable system. This was a huge problem which could have derailed the CUTR project. Why not, asked the CUTR folks, use that same GTFS data that transit agencies already create and maintain? “We built our software so it can essentially acquire data from all transit agencies that participate in Google Transit. We take that same data feed that the agencies provide to Google and use it to update our TAD system,” adds Mr. Barbeau.

The TAD system works with a Google Map-based Internet website and GPS-enabled cell phones. A Java Micro Edition TAD application is downloaded to the cell phone. A cognitively-disabled traveler, or their caretaker, then logs onto the website and brings up the appropriate bus routes. They enter the day and time of their trip, and simply click on the iconic bubbles for the starting

# research



Mark Sheppard, HART Travel Trainer, shows another trainee how to use and program the TAD device.

All of the user interface—what the traveler sees on the phone, is very simple. But behind this interface cutting edge technology is combined with real-world experience and human compassion. Mark Sheppard, a travel trainer for HART has been instrumental in testing the TAD in Tampa. Since he has trained many travelers, the “get ready” and “pull cord now” audio alerts were recorded using his voice. Mark has also been able to test the TAD software as he travels around Tampa during his regular job and give the research team valuable real-world feedback. Sean Barbeau explains, “We would give Mark the latest version of TAD software, and he would put it through the paces on the actual bus.” During the design of the TAD cell phone software, the research team encountered a significant challenge of tracking the person using the cell phone’s GPS in a moving vehicle and giving the “pull cord now” alert at the right time and place. “We couldn’t have a person with special needs get off too early or too late”, said Barbeau. “They could easily end up in a location where the next bus could be an hour away, or lost in an unfamiliar environment.” A patent-pending algorithm was created which runs on the cell phone and tracks the rider’s location in order to deliver the alert early enough to give the rider adequate time to request the stop while making sure they still exit at the correct stop location. Mark’s feedback on how well the system was working during development was invaluable: “Some of the things we thought would work great did not, and vice versa. This learning process was key to the success of the project and an important step in moving the TAD technology out of the lab and into the real world,” said Barbeau.

The “back end” of this project interfaces with Google Maps and HART bus locations and schedules through the Internet. Recognizing the natural concern of parents and guardians about letting their cognitively disabled loved one depend on TAD, the research team built in the capability to track a traveler through the web interface to provide these caretakers with an early warning system. Since a traveler’s route is always known, if they deviate from that route, a text message can be automatically sent to the traveler and caretaker. Of course, all efforts are made to protect the traveler’s privacy and tracking can be disabled. Also, HART buses have GPS, so the TAD system does not look at a static bus route table, but actually finds that exact bus and calculates the minutes

and ending bus stops. The route is given a name, like “Home to Work” and is saved in the TAD database on the Internet.

When the traveler accesses the application on their cell phone, he or she will see a list of the pre-set routes which have been planned using the TAD website, like “Home to Work.” After selecting it, the cell phone then shows the rider the route name for the bus they should board. For example, “5 DOWNTOWN” would display on the cell phone as on the bus, so the traveler knows which bus will take them to their destination. While the rider is traveling on the bus, the phone display also shows the distance to final stop, which counts down as the rider approaches the end of their trip. When the rider is several stops away from their destination, the phone vibrates, beeps, and gives an audible message to “Get Ready!” The distance counter continues to decrease, and when it is time for the rider to exit the bus, they are instructed to “Pull the Cord Now” through both an audible and visual message displayed on the cell phone along with a continuous vibration alert. The traveler then punches the “OK” button to indicate acknowledgement and silence the alert.

before arrival at the bus stop. This information is also shown to the rider on their phone as they are waiting for their bus stop so they know about how long it will be until their bus arrives.

**Philip Winters**, Transportation Demand Management Program Director at CUTR, explains that this project is a win-win solution for all involved. “The transit agency can save money and the user can get more mobility and improved quality of life. Many of these individuals are fully dependent on transit—they won’t ever be able to drive.” Sight-impaired, elderly, wheelchair-bound and brain-trauma travelers can all benefit from the TAD system.

The applications for these types of location-based services (LBS) are staggering. Tourism is an obvious winner, providing travelers with walking directions, points of interest and the closest restrooms. Disaster workers could be out photographing flood levels, and sending all the data and images necessary to assess the situation, including the embedded GPS information on their location and altitude. And there is more, but, excuse me, my phone is telling me that my stop is coming up. Nice talking with you!

## PROJECT RESEARCHERS:

Phil Winters—Transportation Demand Management Program Director, CUTR, USF  
Sean Barbeau—Research Associate, CUTR, USF  
Nevine Georggi—Senior Research Associate, CUTR, USF  
Miguel Labrador—Associate Professor, Computer Science and Engineering, USF  
Rafael Perez—Professor, Computer Science and Engineering, USF  
Amy Datz—Transit Office, Florida Department of Transportation  
Mark Sheppard—Travel Trainer, Hillsborough Area Regional Transit  
Gigi Gonzalez—Transition Facilitator, Exceptional Student Education, Hillsborough County School System

Harvey Berlin—Transit IDEA Program Manager, Transportation Research Board  
Alfredo Perez—Graduate Student, Computer Science and Engineering, USF  
Milena Sarmiento—Graduate Student, Computer Science and Engineering, USF  
Dmitry Belov—Graduate Student, Computer Science and Engineering, USF  
Oscar Lara—Graduate Student, Computer Science and Engineering, USF  
Ismael Roman—Student, Computer Science and Engineering, USF  
Francis Gelderloos—Student, Computer Science and Engineering, USF  
Arica Bolechala—Graduate Student, Applied Behavior Analysis Program, USF

## USF Bridge to Doctorate Program

The University of South Florida recently held a kickoff event to welcome and introduce new NSF Florida Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP) Bridge to the Doctorate fellows to the University community. The program has ridden a wave of success thanks to program co-directors, Dr. Shekhar Bhansali, professor of electrical engineering and Bernard Batson, director of Diversity and Outreach programs in the College of Engineering, faculty mentors and support from USF leadership, including the Provost's Office and the Office of Research & Innovation.

The Bridge to the Doctorate initiative was established by NSF in 2003 to increase the nation's pool of talented Ph.D. scientists and engineers from underrepresented groups. USF's first Bridge to Doctorate program, a joint College of Engineering and College of Marine Sciences project, began in 2004 with the National Science Foundation funding 12 fellowships and USF contributing an additional eight fellowships. By fall 2009, the fellowships have risen to 75 (48 NSF supported and 27 funded by USF) with minority Ph.D. students representing four USF Colleges (Engineering, Arts & Sciences, Marine Science, and Medicine).

Doctoral students Tony and Dorielle Price say NSF's BD and Graduate Research Fellowships (GRF) have provided them with the opportunity to concentrate

solely on their academic studies without distractions of part-time employment or financial burdens. It has also provided them with the camaraderie of a group of other graduate students who are more like family and not just a network.

The fellowships are highly competitive and include a \$30,000 per year stipend along with full tuition and fees, and student health insurance for two years.

Al-Aakhir Rogers, a current Bridge to Doctorate student says, "The BD program has been a tremendous asset to my academic life. So, as a future faculty member, I am confident that my preparation and successes will grant me the opportunity to give back to the scientific community as the BD program has done for me."



Rogers

The goal of the NSF FGLSAMP Bridge to the Doctorate program is to develop these graduates to fill research and leadership roles in university, industry, and national lab environments.

## NNRC Expands Major Toolset

The Nanomaterials and Nanomanufacturing Research Center (NNRC), housed in the Nanotech I building, is a university-wide user fabrication and metrology center that provides state-of-the-art equipment, professional support personnel and infrastructure to enable multidisciplinary research. The Nanotech I facility supports research projects of faculty, graduate students, undergraduates and industrial researchers. Research areas include: nanomaterials and nanomanufacturing methods related to fundamental materials science, sensors, actuators, electronics, bio-systems, medical products, optics and integrated micro and nanoscale systems. The Nanotech I (NTA) building is located on the University of South Florida Tampa Campus between the Science Center building (SCA) and the Kopp Engineering Building (ENG).

In the past few years, the Center has expanded its major investment toolset to enable some key capabilities or process technologies. Highlighted below are these new tools along with some applications the USF Engineering researchers have performed with these tools.

### Focused Ion Beam Microscope

The Focused Ion Beam (FIB) microscope uses a focused beam of gallium ions to cut away (mill) materials with nano to micrometer dimensions. The dual beam instrument combines the FIB column with a multiple-mode Scanning Electron Microscope (SEM) column in a single vacuum chamber.

The FIB is used to selectively remove material from substrates (both insulating and metallic) in user-defined patterns. With the addition of an organometallic gas injection system, the FIB can also be used to create patterned structures, typically from platinum or carbon.

The SEM column is used for sample imaging or charge neutralization when milling insulating materials. It is a variable pressure/environmental type that operates in high and low vacuum conditions. For imaging, the instrument is equipped with an array of electron detectors such as secondary, backscatter, and large-field in addition to an energy dispersive X-ray detector for compositional analysis. A thermoelectric stage can be fitted to control and vary sample temperature during imaging.

Typical uses for the FIB include milling for cross sectional analysis and structural modification at the microscopic level. The sample preparation procedure for the Transmission Electron Microscope (TEM) requires use of all the FIB components including the gas injection system for protection layer deposition, patterned cross-sectional milling, nano-manipulator for sample lift-out, and an additional step to thin the sample and increase electron transparency.

The combination of capabilities in a single instrument makes the dual beam FIB/SEM system a versatile multi-tool for performing tasks essential to nanomanufacturing and materials research.

### Transmission Electron Microscope

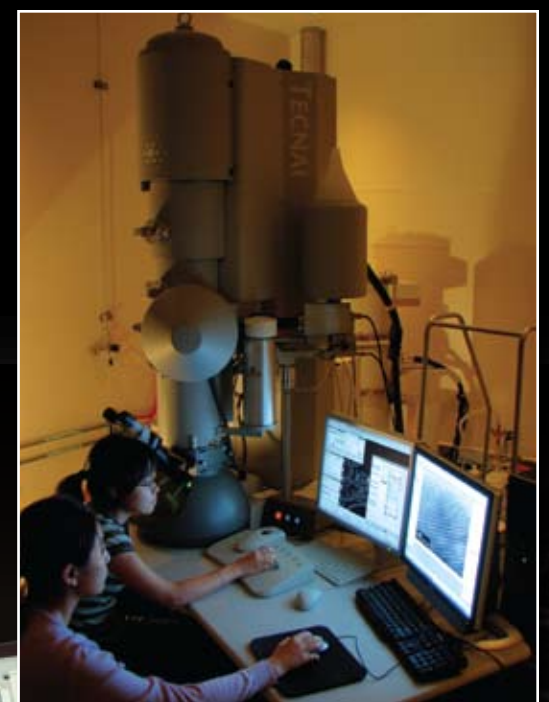
The Transmission Electron Microscope (TEM) uses a high energy electron beam focused through a series of electromagnetic lenses to investigate a sample for imaging purposes. The sample must be less than 500 nanometers thick for the electrons to pass through without significant absorption. The interaction of the electrons from the beam with the atoms in the sample produce an image that is projected onto a fluorescent screen for visual analysis or digitally collected with a CCD camera.

The short wavelength of the electrons generated in the microscope enable the TEM to obtain images at atomic resolution in excess of one million times magnification. The instrument must be insulated from vibration and temperature fluctuations to achieve this resolution. As a comparison, the maximum magnification of an optical microscope is approximately one thousand times.

The TEM is widely used in the scientific community for imaging materials and analysis of composition, interfaces, defect sites, and crystal orientation. The combination of atomic resolution imaging and material characterization makes the transmission electron microscope an indispensable tool for nanotechnology research.

### Deep Reactive- Ion Etch Tool Alcatel AMS 100

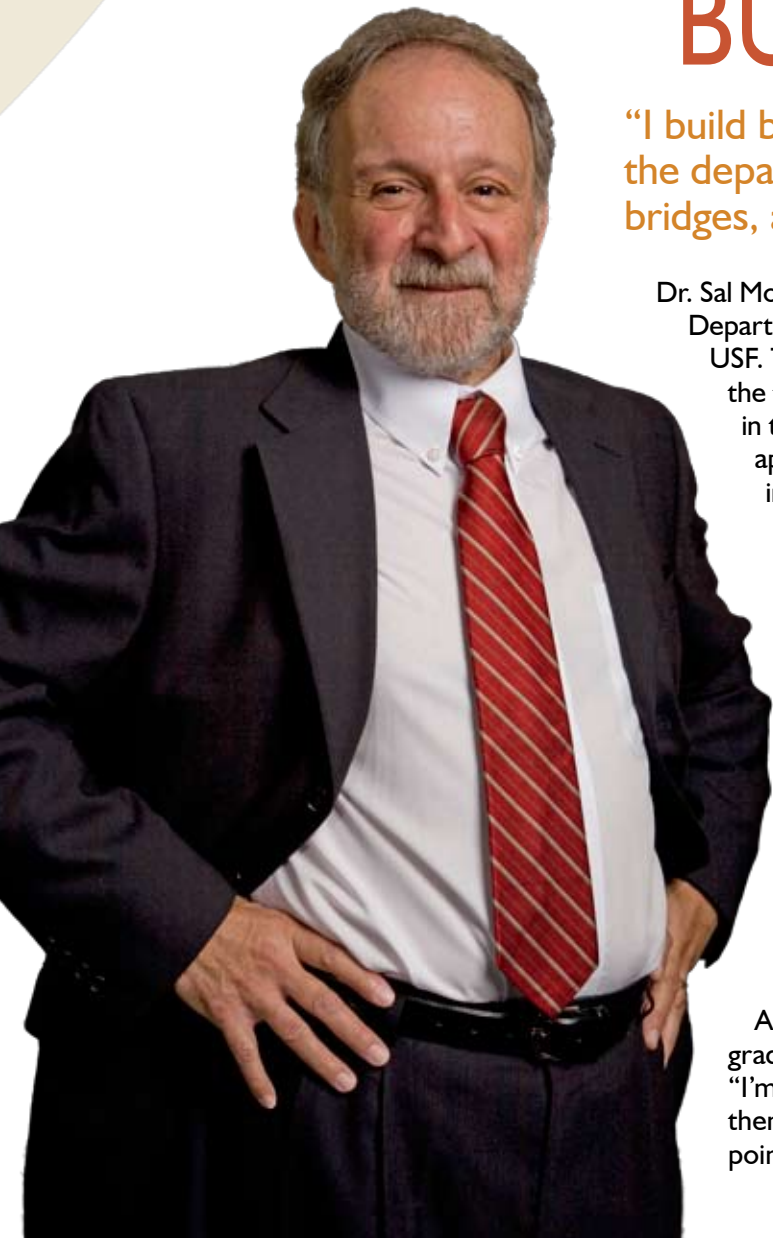
Deep reactive-ion etching (DRIE) is a highly anisotropic etch process used to create deep, steep-sided holes and trenches in substrates or wafers, with aspect ratios of 20:1 or more. It was developed for microelectromechanical systems (MEMS), which require these features, but is also used to excavate trenches for high-density capacitors for DRAM and more recently for creating through wafer via's (TSVs) in advanced 3-D wafer level packaging technology. The tool can etch either silicon or dielectric materials and is used for a wide variety of research projects.



Bottom: Focused Ion Beam microscope  
Inset: Transmission Electron microscope



# New Chair of Electrical Engineering Department is a **BRIDGE BUILDER**



**“I build bridges. To strengthen the department is to build many bridges, all sorts of bridges.”**

Dr. Sal Morgera is the new Chair for the Department of Electrical Engineering at USF. To make USF Engineering one of the top electrical engineering schools in the nation is his lofty vision, but his approach is grounded in real-world industry experience. “Electrical engineering is not the narrow discipline it used to be. It’s a very broad discipline that can influence a wide variety of other areas,” Dr. Morgera explains.

Dr. Morgera will begin with the creation of an advisory board. Members will include professionals in electrical systems, medical doctors, Ph.D.’s, individuals from software and other industries, local corporations and educators from other universities.

An exit interview with every graduating student is also priority. “I’m going to close the door and ask them very frankly what were the high points and low points in their educa-

tion. My intention is to meet with that group and find out what their experience was like. It is very important for the alumni to feel that they have graduated from a high-quality program that has prepared them well and maintained its standards,” Dr. Morgera says. Increasing admissions standards, adding honors programs and creating leadership opportunities will continue to enhance the experience for students and alumni.

Dr. Morgera will focus on a multidisciplinary approach to training engineers. “The grand challenges of the future will be met through teamwork, where each team member is an expert in a particular discipline, but is also conversant in other disciplines and has an appreciation for a multidisciplinary approach. So many distinct, but overlapping, perspectives at the table will empower us to solve grand challenges.”

Soft engineering skills will be given priority. These skills include writing, speaking, project management, economics and leadership. “What good is an outstanding engineer if they can’t effectively present what they are thinking about or what they are working on? I plan to have a few new courses introduced into the curriculum which will be part of an Engineering Leadership Honors Program,” Dr. Morgera says. He also wants to provide industry internships for credit for every student in the department. “It really makes a difference in their confidence, their practicality in their skills, this ability to exercise some of those soft skills. They see firsthand what industry demands of them.”

“I want to bring life to engineering,” Dr. Morgera explains. “I want to emphasize the importance of making the traditional engineering disciplines more lively and exciting through internship, cooperative education opportunities and as many hands-on activities as possible in the curriculum. And I want to bring engineering to life by working at the intersections of engineering and the life sciences and medicine in order to improve quality of life and healthcare and a new model for clinical practice.”

Bringing Life to Engineering – Bringing Engineering to Life. Both together describe an Electrical Engineering program that is lively, exciting, and interdisciplinary – one of the finest in the nation!

## NSF Career Awards

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation’s most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.

### Sanjukta Bhanja

(Electrical Eng) DES auto for micro & NANO system, Computing Processes & Artifact

### Jay Ligatti

(Computer Science & Eng) Trustworthy Computing, Advanced NET Infra & RSCH

### Andrés Tejada-Martínez

(Civil & Environmental Eng) Icer, Fluid Dynamics

### Amy Stuart

(Interdisciplinary) Environmental Sustainability

### Ryan Toomey

(Chemical Eng) Polymers

### Hao Zheng

(Computer Science & Eng) Computing Processes and Artifact

## Building Honors Dean Burdick

The Engineering II building was renamed last year to the Glenn A. Burdick Building in honor of Dr. Glenn Burdick the College’s second dean. Dr. Burdick quickly and ably filled the shoes of our founding dean, Edgar Kopp who died suddenly.



## Alumni Society Facebook Page

Join today and find out Alumni news first. The Facebook page has 80 fans and 165 Google group members. Are you one of them?

Send your personal and professional news and milestones for the *enVision* magazine through Facebook using the convenient form on the alumni page. Don’t be shy—we love pictures and may include them in a future issue.

<http://www.facebook.com/USF.EAS>



# alumni



## EAS MEMBERS & FRIENDS

The Engineering Alumni Society is pleased to announce the 2009-10 Student Grant Programs:

**Student Society Grants**—EAS will be offering grants for Student Engineering Societies. The grants will help fund leadership and outreach programs, conference travel, and other events/activities which promote USF and the engineering profession.

**Conference Presentation Grants**—Conference Presentation Grants are available to undergrad and graduate students who have been accepted to present, speak, or compete at a regional or national conference. These grants will be available throughout the academic year.

For more info about the Engineering Alumni Society, visit us at [www.facebook.com/USF.EAS](http://www.facebook.com/USF.EAS).

**Dr. Cindy Bethel** a summer Ph.D. graduate of the Computer Science and Engineering Department has been named a 2009 Computing Innovation Fellow. She will do postdoctoral work at Yale University under the mentorship of Brian Scasselati. This is a new NSF funded fellowship position that was highly competitive.

This year marks the 10th anniversary of **McCormick Stevenson Corporation**. Located in Clearwater they provide engineering and design services. The principals are proud USF Alumni: Noel McCormick, Founder and President B.S.M.E. 1986 and Paul Stevenson, Vice President B.S.M.E. 1995. To learn more about their company go to [www.mccst.com](http://www.mccst.com).



Alumni CareerQuest services will be delivered by professionally trained career counselors, job search coaches and employment relation specialists at USF's Career Center in Tampa.

Information regarding registration and Alumni CareerQuest services can be found on the USF Career Center website, <http://www.career.usf.edu/>.

## MOST LUCRATIVE COLLEGE DEGREES

According to CNNMoney the top 15 highest-earning college degrees belong to engineers. Check the list out at [http://money.cnn.com/2009/07/24/news/economy/highest\\_starting\\_salaries/index.htm?postversion=2009072404](http://money.cnn.com/2009/07/24/news/economy/highest_starting_salaries/index.htm?postversion=2009072404).

BCI Engineers & Scientists, Inc., a Lakeland-based engineering firm, is pleased to announce the addition of **Justin Chamberlain** to their Forensic Engineering & Science group. BCI Engineers & Scientists, Inc. is a multidisciplinary engineering and environmental consulting firm, founded in 1977. BCI's primary focus is to develop comprehensive solutions to complex engineering and environmental issues using state of the art professional engineering and scientific resources. For more information, visit [www.bcieng.com](http://www.bcieng.com).



## CORPORATE AMBASSADOR PROGRAM RESTARTS

"As an engineer, and a small business owner, I can appreciate how easy it is to get 'down in the weeds' and focus on your day-to-day small sphere of influence. It is important to be reminded that there is a world-class educational and research organization in our own backyard, developing our future engineers and technologies."

—**Paul Stevenson**, Vice President of McCormick Stevenson B.S.M.E. USF, 1995

The University of South Florida Corporate Ambassador Program was started in 2005. The primary focus is to keep the engineering alumni and business community apprised of the programs, activities and research of the College of Engineering. With over 30 ambassadors from diverse backgrounds, the program has been very successful in spreading the word within engineering-centric industries in the Tampa Bay area. "I was an original member and the '2006 Corporate Ambassador of the Year,'" said Mr. Stevenson. "It is especially important to us alumni as our involvement in the program is our opportunity to give back to the institution that opened so many doors for us."

"I hope that any engineering alumni out there who are interested in 'spreading the word' within their businesses will consider becoming active in the Corporate Ambassador program.

As a conduit to others, they'll demonstrate their pride in their alma mater and afford others the opportunity to reconnect with the USF College of Engineering. The time commitment is small, and the rewards are great!"

For more information, engineering alumni should contact Paul Stevenson, (727) 735-9633, [paul.stevenson@mccst.com](mailto:paul.stevenson@mccst.com).

*Paul Stevenson is the Vice President of McCormick Stevenson Corporation, a small mechanical engineering firm located in Clearwater, FL. The firm specializes primarily in defense and aerospace product development. Fifty percent of their engineers are USF alumni. The company is also the recipient of "Small Business of the Year 2005," and voted one of the "Best Places to Work" by the Tampa Bay Business Journal in 2006.*

## ALUMNI EVENTS CALENDAR

**Friday, November 20, 9-11:30 p.m.**  
**Serengeti Night Safari at Busch Gardens**

This unique opportunity is offered at a significantly reduced price for USF alumni. Reservations will be accepted beginning October 19, 2009. Call 1-888-800-5447 for more information and to make reservations.

**Saturday, March 27, 2010, 6-10 p.m.**  
**Bullarney 2010**

Mark your calendar for this engineering tradition. Tentative location Embassy Suites.

## ALUMNI CAREERQUEST OFFERS FREE ALUMNI CAREER SERVICES

Recognizing the difficulty of finding employment in the current economy, the University of South Florida Career Center, in collaboration with the USF Alumni Association, now offers career and job search assistance services to all USF alumni. The services will be exclusively for unemployed alumni who have earned a degree from USF and will be provided free of charge.

Alumni CareerQuest is not intended to be a job placement or employment program, but alumni will have access to a wide variety of on-site and virtual resources, professional career coaches, workshops, webinars and state-of-the-art job search preparation software systems and will also be eligible to participate in recruitment venues that will allow them to network and connect with organizations seeking to hire candidates from USF.



Dean John Wiencek and EAS President Sandy Pettit give the Go Bulls sign at the Heart of Gold Scholarship luncheon



**Saturday, March 27, 2010**  
**USF Embassy Suites**  
(tentative location)

Sponsorships and Volunteer Positions Available

For more information contact [s-pettit@verizon.net](mailto:s-pettit@verizon.net)

USF Engineering Alumni Society

# faculty & staff

## COLLEGE OF ENGINEERING STAFF NEWS

**Ed Van Etten**, IT support specialist in the Chemical and Biomedical department received a Quiet Quality Award.

**Gloria Hanshaw**, program assistant in the Industrial and Management Systems Engineering department received a Quiet Quality Award.

**Yvette Blanchard**, academic program specialist in the Computer Science and Engineering department was recently named College of Engineering Outstanding Staff member for 2008.

Professor **Dolores Gooding** retired in April after 33 years as a faculty member of IMSE. Much of her work centered on students - teaching, mentoring and advising. She took on roles as department chair and director of various programs such as the Florida/Yugoslavia Exchange program and collaborated with UF on the NASA Technology Transfer Program. Her main responsibilities have been Director of the Engineering Management Master's Program and Director of the newly developed Center for Applied Research in Medical Devices (CareMed) with the support of the Florida High Tech Corridor Council and the Florida Medical Manufacturers Consortium as well as the development of an Executive M.S. in Engineering Management and M.S. in Regulatory Affairs. Professor Gooding is a co-founder of the USF Engineering Expo which helps introduce engineering to many of our pre-college youth. —by Dr. Paul Schnitzler

**Dr. Jose Zayas-Castro**, professor and chair of the Industrial and Management Systems Engineering Dept. received the John L. Imhoff Global Excellence Award for Industrial Engineering Education at a special awards ceremony held at the American Society for Engineering Education (ASEE) annual conference and exposition in Austin, Texas on June 17, 2009. This national award recognizes Dr. Zayas-Castro's work to promote Industrial Engineering beyond our borders at USF as well as in his previous work at other institutions.

**Dr. Babu Joseph**, professor and former chair of the Chemical and Biomedical dept. was elected a Fellow of the American Institute of Chemical Engineers in May 2009. This is an honor reserved for one percent of the society members based on professional contributions and service to the profession.

**Wayne Echelberger**, Ph.D., P.E., Professor Emeritus of Civil and Environmental Engineering (Department Chairman, 1989-96) was honored as Engineer of the Year by the Tampa Chapter of the Florida Engineering Society the Tampa Bay Engineers Week Banquet 2009.

## MASTERS DEGREE PROGRAM IN MATERIALS SCIENCE & ENGINEERING

Materials Science and Engineering (MSE) applies fundamental principles of physics and chemistry to

engineering materials, with a focus on the interrelationship between material structure, their properties, and means by which they are processed. It impacts multiple facets of our economy, such as aerospace, electronics, transportation, communication, construction, recreation, entertainment, environment and energy. The goal of the M.S. in MSE is to provide a route for well-qualified undergraduate students for in-depth graduate-level work including structured courses and research experience, in preparation for work in industry or for entrance into a relevant science or engineering Ph.D. program. For more information visit <http://mse.usf.edu/>.

Tau Beta Pi, the engineering honor society, honored **Dr. Thomas E. Wade**, professor of electrical engineering for 40 years (24 of them at USF) its fourth McDonald Mentor on October 17 at the 2009 annual national convention in East Brunswick, N.J. The award recognizes engineering educators who have shown true concern for the individual, supporting an environment for developing talents, and who have earned respect and recognition for their contributions to their field and to the greater community.



*Dr. Norman Pih (l.), member of Tau Beta Pi's Executive Committee, presenting the McDonald award to Dr. Thomas Wade at the 104th Tau Beta Pi National Convention held in New Brunswick, New Jersey hosted by Rutgers University*

## Theirs is A Heart of Gold

There are two inspiring and remarkable people in the College of Engineering who have been on campus longer than most of the students have been alive. Daily they share their knowledge and encouragement to the discouraged and distracted. Two people with different backgrounds and experiences, both committed to education, have established scholarships for students who are succeeding in their education but struggling to make ends meet.

**Dr. Thomas E. Wade** has taught electrical engineering for 40 years, 24 of those at USF. He came to USF in 1985 as the very first Associate Dean for Research in the College of Engineering. He has established the Thomas E. and Ann C. Wade Scholarship, using a combination of his own funds, matching funds from Dean John Wiencek and honoraria from his many awards to help engineering students. After returning to the EE dept. in 1992, he taught both graduate and undergraduate courses. "I have taught an electrical circuits course for years, which is the first EE course. It is the one that most students use to determine whether to go into electrical engineering or not," Dr. Wade explains. "It is a gateway course for engineers. I also teach the

history of electronic technology, in which about 20 percent of the students are non-engineers."

Dr. Wade has specific advice for students, advice that he himself has followed. Undergraduate engineering classes are extremely challenging, and in 40 years, he has advised a myriad students that, "If you set your mind to it, you can accomplish anything within reason." Then he would point the student in the direction of tutors, financial aid and other assistance. In a few years, the students come back, grateful for the encouragement. The letters of recommendation Dr. Wade will write for these students are his reward for the personal time and effort he has invested in countless students over the years.

**Linda (Lynn) Federspiel** has worked at USF for 32 years. She has also established a scholarship with her life insurance policy. "I won't be here to see the recipients because I'll be gone," she said. "But I also give book scholarships. It's not a lot of money, but I was able to talk to them and help get them over the hump." Lynn received a scholarship for her first year of college, but then dropped out to start a family. She found a mentor and sup-

porter in an in-law, a woman with a Ph.D., who, as Lynn gratefully acknowledges, "was insistent that I start back to school. I could not afford it and had a two-year old son. And so she paid."

"You just have to hang in there and hold on and continue to move toward your goal," says Lynn. "I know it was hard. Sometimes I would say to my mentor 'I don't think I can do this', and she would pick me up and pump me up." So when students would arrive in Lynn's office looking for help, they found a person who had literally walked in their own footsteps years earlier.

Both Dr. Wade and Lynn Federspiel have established multiple scholarships. Some are for USF students and some for other universities that have held special significance in their lives. Both recognize the importance of mentors, of financial aid and most of all the encouragement and personal dedication it takes to get an education. Lynn and Dr. Wade encourage you to consider creating a scholarship fund of your own. If you would like more information on how to establish a scholarship, please contact Brett L. Woods, CFRE, Director of Development at (813) 974-9199, [bwoods@eng.usf.edu](mailto:bwoods@eng.usf.edu).



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## USF: UNSTOPPABLE College of Engineering

Welcome to your inaugural edition of *envision*. We hope that you enjoy your new magazine. Please let us know if you have thoughts, suggestions or know of a story that you'd like to see.



What better time to introduce myself than with the rollout of *envision*. In case we haven't met, my name is Brett Woods. I joined the College in January after visiting campus and finding myself somewhat awe-struck. I could not believe that USF was only fifty-three years young and the College of Engineering was forty-four years young! I was amazed that USF was the 9th largest public university in the country with some 47,000 students. I was inspired by the vision of Dean Wiencsek and the bold and vibrant leadership of President Genshaft. With over a decade of experience in higher education, I couldn't imagine a more exciting place to be. The many alumni, friends, parents, faculty and staff that I have met have all welcomed me to the USF and the College of Engineering family with open arms—thank you!

As you have likely heard by now, USF recently launched a significant comprehensive fundraising campaign titled USF:UNSTOPPABLE. The title of our new publication just happens to fit nicely with the Campaign. *envision* an UNSTOPPABLE USF and College of Engineering. What do you dream of for the College? Perhaps a new undergraduate building to accommodate our growing numbers? More scholarships for deserving and talented students? More professorships to attract those at the top tier of the profession? As you might imagine, that is exactly what the Development Office will be focusing on during the Campaign. We can become UNSTOPPABLE by expanding all three of these key initiatives.

Of course, there are other opportunities within the College, such as the Hall of Flags project. This highly visible student space needs a serious facelift. This is our flagship space. By creating an updated, fresh and inviting space, we know it will help with student collaboration and recruitment as well as providing a modern space for firms recruiting our students. We invite you to consider how you might become involved in refurbishing this prominent flagship space of the College.

A month ago, we celebrated a very special day. That day we invited our endowed scholarship donors to meet their student recipients. This was a very special day for all involved. Our students are so grateful for your support. For some, scholarships enable them to stay enrolled. For others, a scholarship provides well-deserved recognition for a job well done and for others, a scholarship accomplishes both. For donors, the day enables them to personally meet the students they have invested in. Through the generosity of donor support to the College, we awarded \$115,000 to 97 students. We call this event the "Heart of Gold" luncheon. Whether you support our students through the general fund or through a specific scholarship fund—we think you have a Heart of Gold! On behalf of our students, thank you for your support.

My outstanding team-mate, Mandi Alexander and I look forward to working with you to ensure that the College of Engineering is truly UNSTOPPABLE. To those of you that have long supported USF and the College of Engineering, please accept our gratitude. We invite anyone with ideas or questions concerning private philanthropic support of the College to contact us.

We challenge you to *envision* what an UNSTOPPABLE College of Engineering would look like. And we invite you to join our UNSTOPPABLE trajectory with your time, talent and gifts if you haven't done so already.

## IS IT REALLY GREEN?

Lots of products advertise they're green, but what does it mean to be green?

Chemical Engineering researchers work on **renewable energy solutions**

2009 Heart of Gold Scholarship awards\* \$115,000 to 97 students

**NEW** Alumni Society Facebook Page—p.11



# enVISION

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