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USF College of Engineering

**USF** UNIVERSITY OF  
SOUTH FLORIDA  
COLLEGE OF ENGINEERING



**enVISION**  
M A G A Z I N E

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#### 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.

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## Message from the Dean



*Dean John Wiencek*

There has never been a more exciting time for higher education. As we tackle the challenge of doing more with less, I am proud to say we are succeeding. The latest U.S. News & World Report 2014 college ranking has our engineering graduate program moving up three spaces from last year to No. 69 among public institutions. Consider the fact that just five years ago, we weren't ranked at all, and you'll realize how far we've come.

There has never been a more exciting time to be a student in the College of Engineering because there are more opportunities to put their education into action by solving real-world problems. In this edition of Envision magazine, you'll read about engineering students and faculty involved in problem solving from the local level to a global level and alumni and business leaders who are giving back.

As Floridians, we live with water restrictions to preserve this precious resource. USF faculty and student researchers were recently awarded the largest sustainability grant in USF history to turn wastewater into a renewable resource. While they partner with university researchers world-wide, the knowledge the students gain may one day solve water issues in Florida.

In a 2011 study by Transportation for America, Tampa was ranked the No. 2 most dangerous city for pedestrians. What's worse is the top four cities on the list were located right here in our state, making Florida the deadliest state in the nation according to a national study in USA Today. The Center for Transportation Research is spearheading the annual Bulls Walk and Bike Week to educate our community and make drivers more aware of pedestrians and bicyclists.

There has never been a more exciting time to give back to the college. We are extremely fortunate to have alumni and business leaders who contribute their time, talent and treasure to our students. Two initiatives that were guided by our Advisory Board (a group of alumni and local business leaders) resulted in two outstanding programs.

The Leadership and Teamwork in Engineering program seeks to teach seniors the soft skills – communication, leadership qualities, dealing with different personalities, personal responsibility – that are not taught in the classroom but are so beneficial to success in the workplace.

Another advisory board career initiative, Bulls Engineering Success Training, has students from all disciplines working in teams on products, innovations and exploratory projects within local engineering companies. This exposes students to actual workplace experiences, making them highly sought after by employers.

Finally, I want to recognize mechanical engineering professor Autar Kaw on being named 2012 U. S. Professor of the Year. He is the first Florida professor to receive this outstanding recognition and our undergraduate students are fortunate to have the opportunity to learn from this innovative educator.

These are day-to-day examples of the quality engineering education our students receive. While we continue to deal with ongoing budgetary pressures, I want to assure you that I will continue to move our college and our profession forward in these challenging times. Together we have done great things already, but even greater things are yet to come!



# Turning Wastewater into a Renewable Resource

## USF Researchers Awarded \$3.9 Million for Game-Changing NSF Grant Project

By Vickie Chachere, USF News and Janet Gillis, College of Engineering

**A**n international team of researchers led by the University of South Florida will spend the next five years designing, implementing and teaching about a revolutionary attempt to turn wastewater into usable water, energy, and nutrients under a \$3.9 million project funded by the National Science Foundation. As USF's largest-ever sustainability grant, this project sets new standards for interdisciplinary research in water and energy.

The coalition of nearly three dozen faculty and researchers will include about 100 undergraduate and graduate students from institutions in the United States, the Caribbean and Europe. Included in the effort also are USF's master's degree students who are part of a unique graduate program with the Peace Corps where they are already working and conducting research in developing nations. USF is joined in the project with the University of Virgin Islands and the University of Belize. European partners are the University of Exeter, the UNESCO-IHE Institute of Water

Education in the Netherlands, and the Institute of Chemical Technology in the Czech Republic.

"What makes the USF project unique is that we are working together from the start in the research enterprise, rather than farming out parts of the study to disciplinary specialists along the way," says Christian Wells, co-PI and associate professor of anthropology. "By bringing together sustainability scientists from all across USF we can begin to address global problems from a more holistic perspective."

The project's overarching research question, said professor of civil and environmental engineering James Mihelcic is: Can effective, geographically-appropriate, and culturally relevant engineered systems be established that utilize wastewater as a resource for recovery of energy, water, and nutrients?

Mihelcic, who leads USF's Master's International Peace Corps program, said the project seeks to find new ways to convert wastewater into a renewable source of water, energy

and nutrients and to change the way the world thinks about wastewater to be "not as waste, but a resource."

"This is the most significant sustainability research project that USF has landed," Mihelcic said. "NSF is funding this work because it can be transformational in tackling complex problems currently facing the Tampa Bay region."

The effort is funded as part of the NSF's Partnerships for International Research and Education (PIRE), an agency-wide program supporting international projects in the science and engineering communities. Specifically, the project comes under the NSF's efforts to advance sustainability science, engineering and education as an approach to global challenges associated with population growth and the strain on limited natural resources.

"This project epitomizes the translation of USF goals and strategic initiatives into action - world class research, outstanding student recruitment, global collaborations and connections, and enhancing our



interdisciplinary base here at USF," said Linda Whiteford, professor of anthropology. "This combination of engineering and the socio-behavioral sciences is truly a cutting-edge framework for the future."

The goal of the program is to catalyze the best new ideas and practices on reusing wastewater as a resource while incorporating educational opportunities that broaden students' participation in science, technology, engineering and math courses related to sustainability, such as seminars and undergraduate research experiences.

"This project is unique in terms of its systems approach. It focuses not only on one stage of a new system, but the entire life of the system (cradle to grave) to avoid problem shifting across the life cycle stages. It looks at not only technological aspects of new systems, but across environmental, economic and social systems and their interactions to avoid unintended consequences. Such systems thinking and analysis are critical for the sustainability of new innovations and the sound training of future engineers," said Qiong (Jane) Zhang, an assistant professor of civil and environmental engineering who will lead the system analysis of the project.

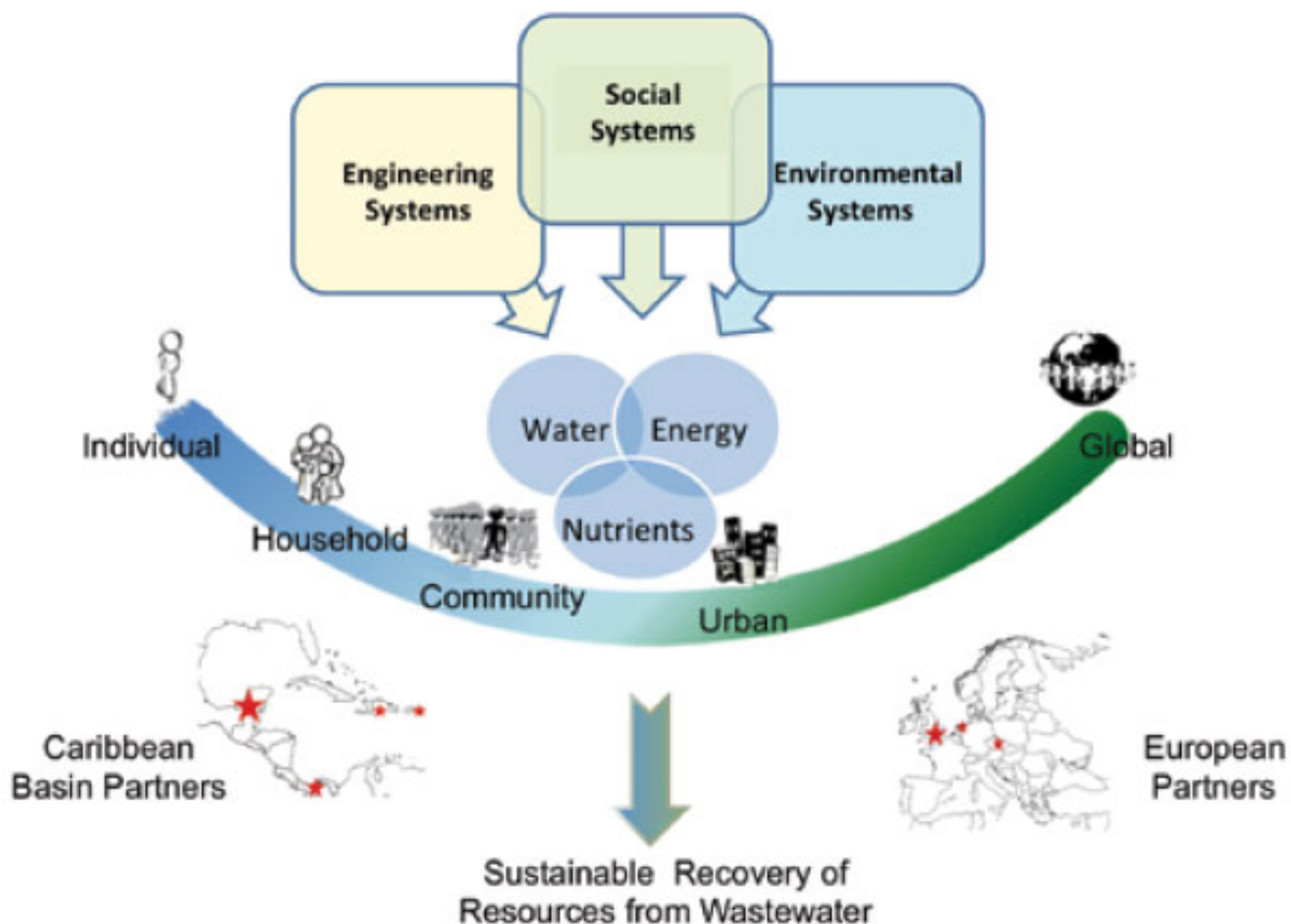
The PIRE will introduce a very exciting partnership with the University of the Virgin Islands (UVI) that allows their undergraduate students to complete dual bachelor's degrees in science and engineering said Associate Professor

Maya Trotz, who is also co-PI. Known as a 3+2 program, USF established this relationship with Bethune-Cookman University in 2006 where science students complete three years there followed by two years in USF's College of Engineering. Given the student demographic at UVI, we expect this partnership to increase the diversity of the college.

The project looks at social and cultural shifts which need to occur to ensure that the new systems created are understood, used and accepted by communities – including addressing the perceived risks of reusing wastewater. Tampa, a community that has struggled with how it can effectively reuse treated wastewater, will be one of the study sites.

"This grant will provide great opportunities for graduate students to not only be part of an international team of experts addressing the conversion of wastewater into usable forms but also to learn how to effectively collaborate with researchers across disciplines and boundaries," said Karen Liller, dean of the USF Graduate School and associate vice president for Research and Innovation.

Whiteford, Wells and Rebecca Zarger (assistant professor of anthropology) recently returned from Belize where they established relationships with partners there. "We found a wide range of ways in which people are using—or trying to use—local resources to solve global problems," said





Wells. "Our work will help these communities navigate some of the challenges associated with managing sanitation systems and accessing clean water while creating new sources of energy in the face of changes to the global economy. A major contribution to emerge from this work will be identifying the broader causes and consequences of human decision making in the face of environmental change."

The project will attack the challenge of converting wastewater into usable resources through various fronts – not only engineering new systems, but addressing environmental and social challenges associated with a radically new approach to wastewater management. The proposal includes several new systems for cleaning wastewater and managing the waste portion of the product in a safe manner that does not create another environmental or human health challenge.

Mihelcic said students and faculty will be trained to work not only in these interdisciplinary teams, but also understand how to function in global problem solving teams, learning about best practices and solutions that can be transferred across geographical and cultural boundaries.

"The ability to work in teams is absolutely critical for today's graduates and projects such as this greatly help prepare students for future leadership positions. Graduate students have become greatly interested in pursuing careers in sustainability and the experience afforded by this project will bring the involved students closer to their goal of leading sustainability efforts globally," added Karen Liller.



Top: Professor Rebecca Zarger on site at the Belize City Lagoon.  
Bottom: Aerial photo of the San Pedro Lagoon.

"The research is important because it addresses very complex issues of water scarcity and supply, energy production, wise use of finite natural resources, protection of the environment and mitigation of climate change – all critical issues that will protect the environment while also improving economic and social well-being of residents of Florida, the United States and the world," said Mihelcic.

## The USF team is comprised of:

- From the College of Engineering: James Mihelcic, Maya Trotz, Sarina Ergas, Daniel Yeh, Qiong (Jane) Zhang, Delcie Durham, Yogi Goswami and Bernard Batson.
- From the Department of Anthropology: Christian Wells, Rebecca Zarger and Linda Whiteford.
- From the College of Marine Science, Frank Muller-Karger, and
- From the College of Education, Allan Feldman.



# Capstone Students Working on Real Projects in Real World Situations

By Janet Dawald

A record number of Computer Science and Engineering students are completing their capstone projects this spring. Ken Christensen, PhD, PE, professor and director of Undergraduate Program in the Department of Computer Science and Engineering, is now in his thirteenth year of turning students into industry professionals. "We usually have 20 to 25 students at a time in this course," Professor Christensen explains, "but this capstone semester we have 38 students. Computer science and computer engineering is booming in enrollment in the college."

Originally conceived as a course for graduating seniors to demonstrate their abilities and literally show what they have learned in college, engineering capstone courses have evolved into an opportunity for students to design and produce a useful product. The latest incarnation of capstone courses work directly with industry partners to not only develop useful products, but also to learn the soft skills necessary to work in teams, understand project planning and scheduling, give presentations, and deal with uncertainties and ambiguities in a professional manner.

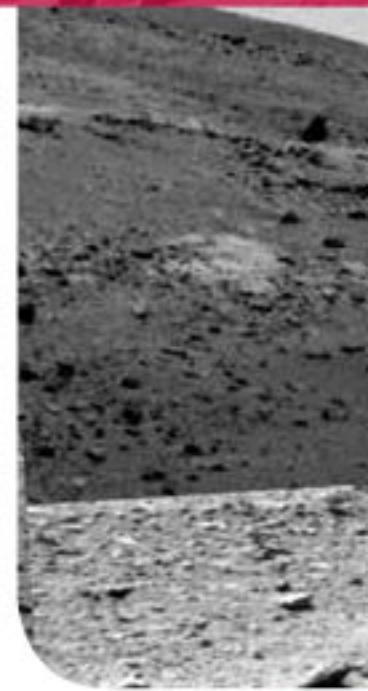
The Computer Science and Engineering capstone course (CIS 4910) at USF has taken the concept of working with industry to the next level. Many corporations have benefitted from having students tackle an engineering problem. It is win-win situation for students and for businesses. Under the leadership of Christensen since 2000, many of these projects also have a third tangible benefit: to society. Projects range from cutting edge technology to assisting handicapped people, detecting fallen patients in hospitals, educating children with diabetes, modeling manatee-boat collisions in Tampa Bay, and bringing Martian geology to the public are just a few of the projects that students have tackled. These projects provide serious professional experience for students and far-reaching benefits for industry and society.

Every semester, Prof. Christensen works with his industry and university contacts and puts together from five to ten carefully selected projects for students to choose from. Each project consists of a team of students, from

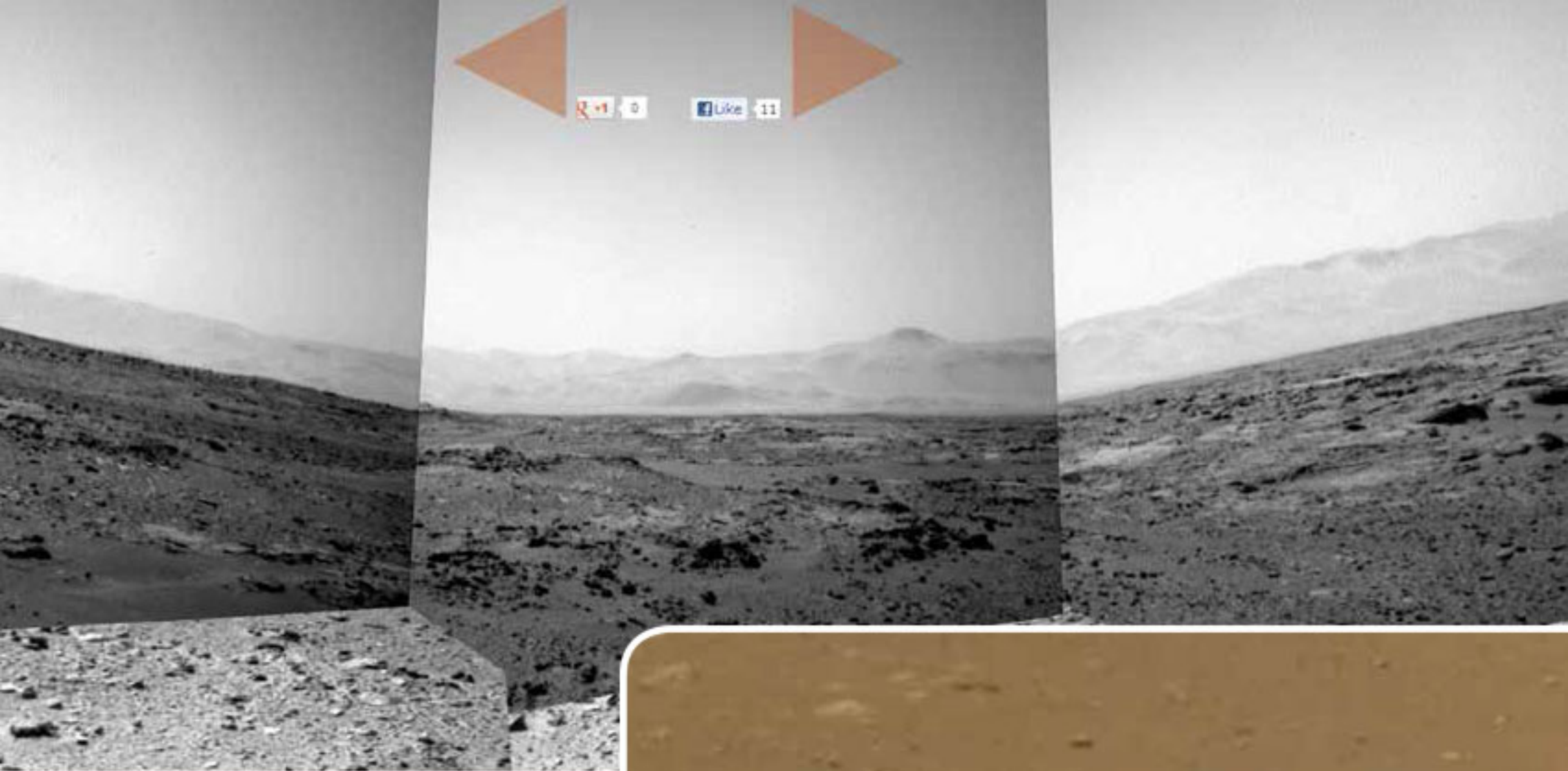
three to five members, who select their project, develop requirements and specifications, prepare a test plan, implement their design, test it, demonstrate it, and produce a final written and oral presentation.

The companies involved have the first look at the upcoming graduating class. They also have the opportunity to have a non-critical "back burner" problem solved. Many companies choose to have students look into a new technology, so the company can "get smart" about the technology. "For example," explains Christensen, "a company wants to look into touch screen products, so they tell the students to prototype a product, let us know how we could use touch screens in our business." Or, perhaps they are interested in mobile applications, but currently have limited resources to devote to what is becoming the wave of the future.

A well thought-out project can have far reaching benefits for both the company and society. A recent capstone project involved designing and building the interface software for a wheelchair mounted robotic arm (WMRA) for patients whose body motions have been reduced to eye movement only. Using an "eye gaze" and voice recognition system, the students developed software that integrated with the robotic arm and a power wheelchair control software. They tackled problems such as speech homophones (words that sound alike) and background noise. The resulting hardware and software enabled the arm to pick up a cup, open a drawer, and take a book off a shelf in a reasonable amount of time. "This project was so interesting to me that it became the focus of my graduate studies," says Christine Bringes, one of the students who worked on this project. "This was a unique undergraduate experience and offered real-world work opportunities." This project was done for the Center for Assistive, Rehabilitation & Robotics Technologies (CARRT), an interdisciplinary center involving various colleges and departments at USF.







Redwan Alqasemi, adjunct professor at CARRT, when asked about the capstone projects and working with the Department of Computer Science and Engineering explains: "A mutual benefit serves everyone in these projects. A student needing a project to work on, a professor needing students to work on a project, a project needing to be done, and a user wanting to use such an innovation - everyone wins!"

Capstone projects are not necessarily earth bound. NASA's Curiosity Rover has produced thousands of pictures that can be bewildering to the general public. Students are working on a website that will help the public navigate and express interest for favorite Rover images. According to the students on this project, this application will be "dynamic, fast, fun and sticky." It will help NASA roll out more services to the public, and is an exciting opportunity for the students to be part of NASA's public outreach program. Industry take note: it is not just interest in Martian rocks that can be measured with this project. Like many of Christensen's corporate connections, the NASA capstone project has far-reaching benefits beyond the original scope of the project. According to Mark Powell, '92, '97 MSCS, '01 PHD, senior computer scientist at

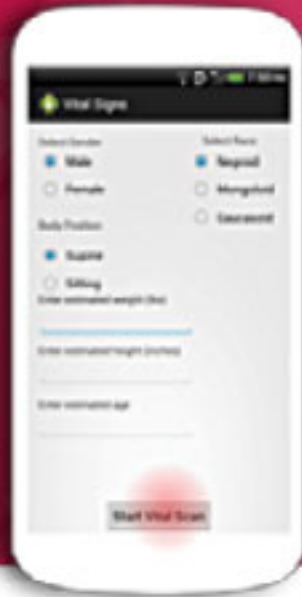
Photos taken by NASA's Curiosity Rover will be featured on a new public outreach website developed by USF students.

NASA - Jet Propulsion Laboratory (JPL), "The new 'Like a Rock' application is another big step forward in engaging people in an interactive forum about exploring Mars: people vote for the images that they want to hear more about, and NASA's science investigation team responds back to the most popular requests. The aim is to keep people connected to the mission week after week and to get more of the kinds of stories people are most interested in published online for their enjoyment."

The experience working with USF students has been very positive, according to Mark who says, "The USF student teams that I worked with both last fall and this spring have the kind of can-do attitude that JPL looks for in everyone we choose to work with. Mentoring these projects is a very rewarding relationship for me."



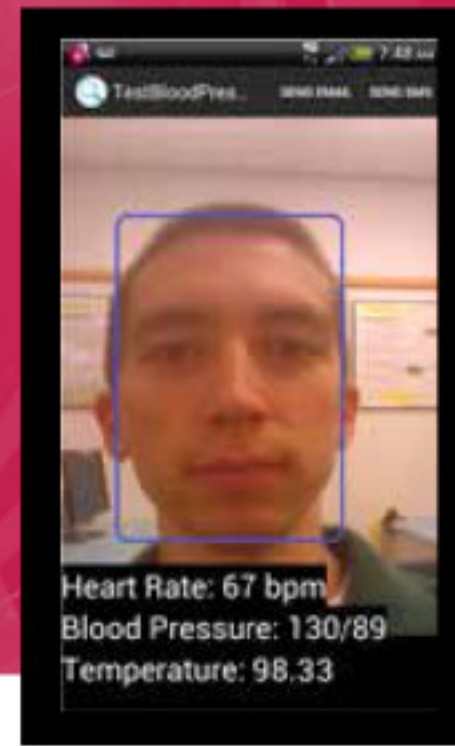
## Start Screen



## Scan Screen



Send data to 911



Raytheon works with USF student to produce an Android mobile phone that reads vital signs.

Raytheon has partnered with several capstone projects in the past, ranging from an apparatus to automatically aim antennas to communications software to touch screen applications. A current project involves using a commercially available Android smart phone to measure vital signs of an individual. This potential product can send the user's vital signs to a specially-equipped 911 system and provide responders with valuable information before arriving on the scene. The ability to monitor pulse/heart rate, respiratory data, blood pressure, temperature and even pupil dilation before arriving on the scene is invaluable. Such a technology would also be deployed on battlefields, providing early data to Medevac personnel.

Like many large companies, Raytheon uses the capstone projects to explore concepts and requirements of an idea prior to allocating scarce resources. They also get a bargain basement price. Jay Schroder, senior principal systems engineer at Raytheon, adds that students in their projects also are put through the Raytheon engineering design process in only 17 weeks, usually a two-year cycle. "We have the engineering students go through the identical design reviews that they would face if they were actually employed by us," he explains. "The student engineering team goes through four major reviews during the semester, with each one bringing on more senior engineers and managers to evaluate their design. If the student does well on these projects, we are pretty confident that they can handle a real assignment at Raytheon."

If your company would like to be involved with Computer Science and Engineering capstone projects, please contact Ken Christensen at [christen@cse.usf.edu](mailto:christen@cse.usf.edu). "A good project involves both hardware and software," he explains, "and is slightly open-ended to allow for student creativity and

innovation. Key benefits to companies include recruiting of future employees, having a non-critical path project completed that they may not otherwise have the resources for, and a meaningful way to give back to the university and the community."

## BEST Stands for "Bulls Engineering Success Training"

Through an initiative started by its Advisory Board, the College of Engineering is moving forward with a college-wide capstone course called Bulls Engineering Success Training (BEST) that will provide selected engineering students a multidisciplinary, industry-based design and development experience. It will be available to students in all programs.

Slightly different than a traditional capstone course or senior semester, a BEST team will complete an industry project in two semesters and earn 6 credit hours. Students will receive mentoring from industry engineers and supervision from faculty.

It will be a great learning experience that will better prepare students for their first job. Industry benefits by completing a project of direct value, while having access to recruit the top students. It's also a meaningful way to give back to the university.

This spring and summer BEST faculty will visit with companies to define the projects as well as recruit students. The first BEST projects will get underway in the fall semester.

For further information about the BEST program or to participate, contact Ken Christensen at [christen@cse.usf.edu](mailto:christen@cse.usf.edu).





# Inaugural USF Bulls Walk and Bike Week Deemed a Success

By Pei-Sung Lin, PhD, Julie Bond, and Quyen Pham

Last fall the Center for Urban Transportation Research (CUTR) at the University of South Florida (USF), with funding from the FDOT Traffic Safety Office, organized and conducted the first annual USF Bulls Walk and Bike Week to promote pedestrian and bicycle safety at the Tampa campus. The educational campaign Walk Wise, Bike Smart, and Drive Carefully focused on the importance of pedestrian and bicycle safety issues at the campus and its surrounding area. The purpose for the week-long event was to engage the USF community to actively promote awareness of pedestrian and bicycle laws to reduce pedestrian and bicycle-related crashes.

The most common causes of pedestrian/bicycle crashes are user inattention and not being aware of laws (right of way, crossing locations, etc). One of the main goals of the Bulls Walk and Bike Week is to educate students, faculty, staff, and even visitors about the Florida safety laws and precautions to take as a pedestrian, bicyclist, or driver.

Pedestrian and bicycle safety is a very high concern, especially in Florida. According to NHTSA Traffic Safety Facts published in 2012, Florida was ranked No. 1 for pedestrian fatalities per capita in the U.S. in 2010. According to the data published by the Florida Department of Highway Safety and Motor Vehicles, Hillsborough County was ranked third in Florida in terms of the number of the pedestrian/bicycle crashes, injuries and fatalities in 2010. In addition, there were 40 pedestrian and bicycle related crashes within a 1.5 mile radius around and including the USF Tampa campus, resulting in 47 injuries and one fatality. Promoting safety to not only pedestrians and bicyclists, but to drivers as well will hopefully bring these numbers closer to zero.

CUTR at USF had the opportunity to team up with the USF Office of the President and the Office of the Vice President for Administrative Services, and various USF departments including the College of Engineering,



Last fall's awareness walk with President Judy Genshaft to Promote Pedestrian and Bicycle Safety

Police, Student Government, Physical Plant, Parking and Transportation Services, Public Health, Office of Sustainability and many other partners to plan this week of events.

The Bulls Walk and Bike Week kicked off with a press conference held in the USF Student Marshall Center. The press conference was hosted by Pei-Sung Lin, PhD, program director from CUTR. The invited speakers

*continued on page 10*





include Judy Genshaft, USF President, Brian Goff, USF student body president, Jim Moulton, director of transportation operations, FDOT District 7, Ramond Chiamonte, executive director of Hillsborough County MPO, Lisa Montelione Tampa city council member, and Jason Bittner, CUTR director.

Afterwards students were able to stroll around campus with President Genshaft to promote the campaign. During the walk, members of campaign passed out promotional items to anyone they saw along the way. These promotional items, included T-shirts, reflective gears, bookmarks, and messages about safety such as “Alert Today, Alive Tomorrow” and “Walk Wise, Bike Smart, and Drive Carefully.” Event posters and yard signs were placed throughout the campus during the week to spread the safety message.

Other activities included educational presentations by Jason Jackman from CUTR, which were held in the Marshall Student Center to teach attendees bicycle and pedestrian safety laws. A Bicycle Celebration hosted by Julie Bond from CUTR was held on Thursday of the week near the MLK Plaza on campus where two lucky winners were drawn from a raffle to win a bicycle. The educational outreach events were also held at the USF Library entrance and at the Bull Market.

Throughout Bulls Walk and Bike Week surveys were conducted to compare the measures of safety performance on the campus before and after the campaign by Yu Zhang, assistant professor from the Civil & Environmental Engineering Department. The result was positive. The improvement is most significant for the intersection closest to the Marshall Student Center, which is where a majority of campaign activities were venued. This implies the importance of the scale and extent of the campaign. The analysis results of a questionnaire survey showed that pedestrians, bicyclists and drivers had different perceptions on vehicle drivers’ yielding behaviors toward pedestrians and bicyclists. It was understood that different users had their points of view, therefore, careful and dissimilar design of education toward different users may be required.



Using information gathered from the surveys and the experience gained from the different outreach events, CUTR and its partners are now planning to assemble a more informative USF Bulls Bike and Walk Week event in the upcoming September.

This year the goal will be to reach a larger audience and have more people participate in the events. The first Bulls Walk and Bike week campaign has shown to increase the awareness of participants about pedestrian and bicycle safety. As the message of becoming a safer pedestrian, bicyclist, and driver spreads, the statistics of incidents, injuries, and deaths related to pedestrians and bikers should start to decline. The USF Tampa campus will become safer and more pedestrian and bicycle friendly environment for everyone.

Use your phone's QR reader to view a video of the Inaugural USF Bulls Walk and Bike Week.



Pedestrian and Bicycle Related Crashes within a 1.5-mile Radius from USF from 2007 to 2010



Pedestrian and Bicycle Safety outreach during the Bike Celebration Event





# Professor Selcuk Kose Working to Extend Battery Life for Mobile Devices

By Tom Edrington

You are surfing the web on your mobile phone, perhaps watching videos, maybe using it as a GPS to find your way to the next appointment. Before long, your battery is running low. This is a fact of mobile device life. You may not like it, but for now you have to live with it.

Selcuk Kose, assistant professor of electrical engineering, feels your pain and he is working to find a solution to what has become a world-wide problem in the mobile device industry. It is all about electrical power, quality power and the ability to get it from tiny batteries to even smaller transistors.

Welcome to the world of VLSI - very large systems integration, and the problem of power, the problem of battery life, the challenge of optimizing tiny voltage regulators and the millions of chips (instead of chips, let's use transistors) that depend on them for efficient power. Kose is a newcomer to USF

but an experienced researcher in the world of complex electrical systems, their design, complex components and the need for more efficient power supplies to those complex systems.

Professor Kose and his wife, Leman, came to Tampa from the University of Rochester, where he received his PhD on June 10, 2012. He left his native Turkey for Rochester in 2006. He is enjoying his new working environment in sunny Tampa.

"You don't have to worry about the weather when you go outside," Kose said, recalling the freezing temperatures of Rochester winters.



Selcuk Kose, Assistant Professor of Electrical Engineering

His doctoral work involved development and design for circuit structures to optimize voltage distribution.

"Continuous 3G use will wear down a battery in three to four hours. Energy efficiency is a very hot topic," Kose pointed out. More mobile devices mean a bigger demand on power sources for recharging those devices. The devices require a higher quality of power and as Prof.

Kose pointed out, "it is getting more and more difficult to provide that quality power."

In order to increase the quality of the power to those devices, Kose is working on ways for the tiny voltage regulators to get power to the chips more efficiently. "We are trying to position multiple voltage regulators into the chips," Kose said.

Prof. Kose's research is a continuation of the quality work that produced his doctorate at Rochester. He continues to apply a multi-disciplinary approach to enrich the focus of that ongoing research. The work spans several areas including circuit design techniques, power grid





analysis, algorithms, mathematical methods to characterize power grids and power delivery challenges in three-dimensional integrated circuits.

There is a key word in there and that is the three-dimensional (3-D) integrated circuits. "Everything right now is 2-D, two-dimension planar," Kose explained. "Multiple planes of transistors make 3-D integration which adds another layer of complexity to the power delivery problem."

Kose brings great work experience with some of the big-name companies in the world of technology. In 2007 and 2008 he worked on the Central Technology and Special Circuits Team in the enterprise microprocessor division of Intel Corporation in Santa Clara, CA.

Eastman Kodak in Rochester was his summer internship in 2009 and in 2010 he worked in the RF, Analog and Sensor Group at Freescale Semiconductor in Tempe, AZ. Freescale was one of the spinoff companies from the old Motorola Corp.

There is an unlimited future in Prof. Kose's area. The electrical and computer engineering world is a fast-growing, dynamic field. The advances in semiconductor

technologies and the huge market demand for more power-efficient portable electronics are nearly overwhelming.

International Data Corporation has projected that the amount of mobile tablets in the hands of consumers will grow three-fold by the end of 2015. Phones have evolved from simple telephone devices to complex processing units with larger screens.

These new devices are going to require more power and they have created a gap between required power and available power. Kose is trying to close that gap. He continues to hone his skills in producing electrical models, circuits, methodologies and algorithms to investigate ways to deliver power more efficiently.

So next time you have that smart phone in use for an extended time, or a computer tablet or even that LED television in your home, feel the screen and the heat that is produced. That heat is energy being drained by those devices. Selcuk Kose is out there to try and cool them off to the fullest extent he can.

## USF ASCE Student Chapter will Host Southeast Conference in 2014

The student chapter of the American Society of Civil Engineers recently competed in the ASCE Southeast Student Conference hosted by the University of Miami and Florida International University, March 14 -16. The team took first place in the Steel Bridge competition and second in Surveying. The Steel Bridge team is heading to the national conference May 31 - June 1 at the University of Washington in Seattle. Next year (March 27-29, 2014) USF will host the ASCE Southeast Conference. The group is looking for sponsors to help them raise the approximately \$100,000 it will cost to host the event.

If you are interested in being a sponsor for the 2014 event, contact Beth Fontes ([bethfontes@usf.edu](mailto:bethfontes@usf.edu)) or Major Alston ([major1@usf.edu](mailto:major1@usf.edu)).







## Big Data Analytics: Focus for the New BSIE Curriculum Starting Fall 2013

By Tom Edrington

**A**nalytics is the science of synthesizing big data and extracting meaningful new knowledge, which can significantly enhance engineering decision making. The industrial engineering curriculum has traditionally been geared toward teaching students how to make engineering decisions by building models using probability and statistics, operations research, and computer simulation, which are the core topics in engineering analytics. However, these decision tools have been traditionally taught with little focus on how they can be empowered with knowledge of big data. The BSIE curriculum at USF has been reformed to offer a stream of new required courses on the fundamental concepts and tools needed to understand the emerging role of big data analytics in engineering decision making.

At the heart of this reform is Tapas K. Das, professor and chair of the Industrial and Management Systems Engineering Department (IMSE), who leads the IMSE faculty on taking a giant leap to keep the BSIE curriculum relevant and current, in step with an ever-changing profession.

"Through the 80's there were manufacturing-related jobs, there were supply chain and distribution sectors for industrial engineering graduates," Das explained. "Today, most industrial engineers are involved in the areas of finance, medicine, health care, and logistics, all under the guise of big data analytics. These are all data-driven fields that require data-driven models for decision making."

Das isn't referring to just ordinary

data. It involves very large data - mega-data. "We are at a crossroads where we must prepare our students not only on how to build decision models, but also on how to feed the models with input derived from synthesis of big data sets."

"So how do we prepare our students for big data?" Das asks.

The main way to prepare them is by providing them with the necessary tools and foundations, and to do that, we needed to initiate change, change that doesn't come easy with undergraduate curriculums.

"Undergraduate programs are the most closely guarded," he explained.

"It is very involved," Das explained. "The change begins with input, a lot of input and discussion from the



entire industrial engineering faculty. We discussed and debated for countless hours. Everyone did agree that it is important to see where the future data-driven jobs are emerging and to make the curriculum more relevant to those emerging opportunities. Every new media article on big data and opinions of our constituents (our industry advisory board, employers, and past and present BSIE students) encouraged us for a change.”

Discussions and debate went on and finally a consensus was reached. But that was step one. We couldn't simply add more courses on analytics. The number to remember in the college of engineering is 128. “The maximum number of required credit hours for the bachelor's degree is 128,” Das pointed out.

“We had to take some courses out and combine some courses in order to make room for new classes,” Das explained. This was a painstaking process requiring data gathering

students must have when they graduate. Considering the curricular constraints, the committee designed a four course analytics sequence and course topics for each course that could be seamlessly integrated into the existing IE curriculum. After several consultations and fine tuning these courses, their content was enthusiastically approved by the entire IMSE faculty.”



Tapas K. Das, IMSE Professor and Department Chair

“Curriculum changes must be approved by the university undergraduate council and the state,” Associate Professor Kingsley Reeves designated faculty liaison with the undergraduate council, explained. He said “we expected some significant challenges from our colleagues on the council as it is their job to vet each curriculum and course change proposal. Fortunately, we were able to make a strong case in support of the proposed change and it was received well. The proposal was readily approved, unanimously, without the need for an extended discussion.”

The first two years for undergraduate BSIE students are



from IE departments across the nation and more debate among IMSE faculty. But the process didn't stop there.

Associate Professor Ali Yalcin, who headed the curriculum committee, added that “a committee of IMSE professors with big data analytics knowledge and experience created a list of core competencies that the

more or less the same as before the curriculum was restructured. There are the STEM courses - the science, math, technology, and basic engineering classes that provide the background for the final two years of study.

“After that, when they (the students) join our department, we will have the new analytics sequence for them,”



Das said. “We have a four-course sequence that will expose them to working with large data bases, learn how to visualize data and how to build prescriptive and predictive analytics models for engineering decision making.

“Basically,” Das went on, “engineers make decisions and in the age of big data, they can make better decisions with knowledge of analytics. The new analytics sequence will start with three credit hours of introduction to engineering programming followed by three credit hours of design of industrial information systems. Then there will be two, three credit hour courses in engineering analytics on prescriptive and predictive modeling.

Many academic leaders in the IE community who have visited the department in the recent months have commented that the new undergraduate curriculum with analytics makes USF’s industrial engineering program one of the first in the nation to take on the challenge. “I think it is very forward looking for USF to include analytics in their IE undergraduate curriculum. The marriage of IE tools for optimization and simulation, and

the knowledge of how to exploit ‘big data,’ will give USF IE’s a competitive advantage,” said Barry L. Nelson, chair of IEMS at Northwestern University.

It has been a long road, but starting with the fall 2013 classes the industrial engineering undergrads will be paving new territory in the academic world. It didn’t come easy, but nothing does when you’re out to effect major change.

“And we are confident that these changes will better prepare our undergrad students to go on to land jobs with companies like Google, Amazon, IBM, Nielsen, Honeywell, and GE, develop innovative ideas for new data driven products and services, or head into top graduate and professional programs,” Das said. “Either way, we recognized what we needed to do to enhance our students’ success and were able to take a big step in that direction. IMSE faculty deserves the credit for a job well done. However, we recognize that student success is a journey that must continue.”





# Autar Kaw, U.S. Professor of the Year Provides Insight into Online College Courses

By Janet Dawald

Photo by Aimee Blodgett | USF News

The Council for Advancement and Support of Education (CASE) and the Carnegie Foundation for the Advancement of Teaching jointly sponsor the U.S. Professors of the Year Award Program. In November, they named Autar Kaw, USF professor of mechanical engineering since 1987, as the 2012 U.S. Professor of the Year (doctoral and research universities). He is the first professor in Florida to receive this distinction.

Within the college, Professor Kaw is the “go-to” guy for the latest information about online education and the newest iteration called Massive Open Online Courses (MOOCs). When it comes to teaching, advising and nurturing students, he is a passionate advocate for them. So it is not surprising that the U.S. Professor of the Year would take this topic far beyond internet learning.

“Well, I have to admit, I am taking a MOOC right now,” said Professor Kaw. “I am taking a course in algebra, I just wanted to get the feel of it,” he explains. An engineering professor taking an algebra class? “I know algebra, and I knew I could do the homework in a fairly short period of time,” he laughs. “But I am learning quite a bit about how they do it, what kinds of assessment they give to students, and how they are teaching it, connecting it to videos and things like that. It is a lot of work to create these courses,” he adds, “It is not just somebody doing a video and putting it on the web.”

MOOCs and internet learning are touted as the future vision of education. “We will always need brick and mortar places,” he answers, “but not for the obvious reasons.”

Providing instruction via a website to anybody with an internet connection is not necessarily the opportunity it is made out to be. Kaw explains: “Like any well-off student, I can take this MOOC because I have the luxury of time. What I am learning from my students is that they don’t have this luxury of time.” Many of his students are working one or two jobs, and at the end of the day are concerned with just getting food on the table. “People don’t realize that low-income students have a very high cognitive load on them,” he adds. “They have fewer choices.”

Online classes are often marketed to people working one or two jobs, so they can fit online instruction into their schedules. “There is some merit to being bound by some commitment, some structure where you go to class Mondays Wednesdays and Fridays, especially for low income students. They can take a class

*continued on page 18*





## Autar Kaw, U.S. Professor of the Year — cont'd.

here or there, but it is very hard for them. Again it is about the choices available." He pauses and reaches into his experience in teaching. "We know that if you are a novice at learning something it is important for direct instruction to take place," he says. "You need personal guidance. Unfortunately, it is these low-income students who need the most guidance. If you are well-off, you go to brick and mortar schools and get the motivation that small classes provide and the valuable one-on-one with the teachers."

He offers an industry example to illustrate this point: "The failure rate for online classes only at the community college level is very high. The student who is directly taking an online class without having taken a traditional

of 30, and only 1 in 25 students at the top 146 selective universities are from the lowest income quartile. "These demographics have radically changed in the past few decades," says Kaw, "But we still use the same old metrics, 4-year and 6-year graduation rates. We need to reach out to these non-traditional students if we want to compete."

"I believe we should be cautious about how MOOCs are used, especially when it comes to money," Kaw warns. "I don't want to see a big chunk of society left behind, and a lot of institutional motivation for these courses is that they are cheap. This does nothing to give less fortunate students the push they need. I am 100 percent for anything that gives students the opportunity to learn something. I am just afraid of the business model, which I fear people are going to adopt."

"You have to look at the people who are taking MOOCs now," Kaw points out. "Over 75 percent already have a college degree, and one-third of them are in a graduate program or have graduate degrees."

Using his own experience in an online algebra class, he adds, "I think that MOOCs are very good for advanced degrees like nursing or an MBA, when you are already an expert in some kind of field. This is very different than teaching an 18-year-old student, he muses. Right now people are not willing to make a distinction between the two."



Photo by Aimee Blodgett | USF News

in-class college course is much more at risk than the person who first took some traditional classroom courses." In other words, you need to learn how to learn, and that requires classroom experience.

Like any good engineer, he also examines the data. In his acceptance speech for the Professor of the Year, he acknowledges that the metrics of the past are being used to measure the students of today. The National Center for Education Statistics reports that two out of three students are working, and half of those who work do so full-time. One student out of four is over the age

Professor Kaw believes a little of both is the best model. "In my opinion there should be a blend of all things," Professor Kaw responds enthusiastically, "blended classes, both in-class sessions and online portions and personalized learning, starting in the K-12 grades. Let people go at their own pace, and determine what their strengths and weaknesses are. And if brick and mortar places are going to compete against these online educations, they have to provide individualized experiences to students, those soft skills you need to survive."



# Leadership in Engineering and Teamwork

Spring semester, with the support of the Engineering Advisory Board, the college held a pilot program that explored ways to expose our undergraduate engineering students to concepts that develop strong teamwork and leadership skills and practiced the use of those concepts during class. The pilot program was structured as a zero credit course, meeting during seven four-hour sessions on Friday afternoons.

Eighteen students participated and a variety of topics were presented by industry representatives as well as three faculty members from the College of Business. Students were asked to provide feedback on the different topics and class exercises at the end of every session as well as at the end of the program. The

students found the topics to be extremely informative and useful. They felt they had gained knowledge and skills that they had not been exposed to during their education here at USF. The presenters felt that students were very much engaged in the lectures and class activities and they significantly improved their skills over the duration of the course.

Based on these results, academic administrators plan to offer a three credit hour version of this course in the fall semester with two sections, each section with a capacity of 25 students. This will be a regularly scheduled course and will require a permit for a student to register.

Engineering students participate in team building exercises during an informative leadership session.

Photo by Ryan Wakefield | College of Engineering





# Providing Access to Clean Water in the Driest Place on Earth

Two USF Professors are working on this challenge with scientists in Saudi Arabia.

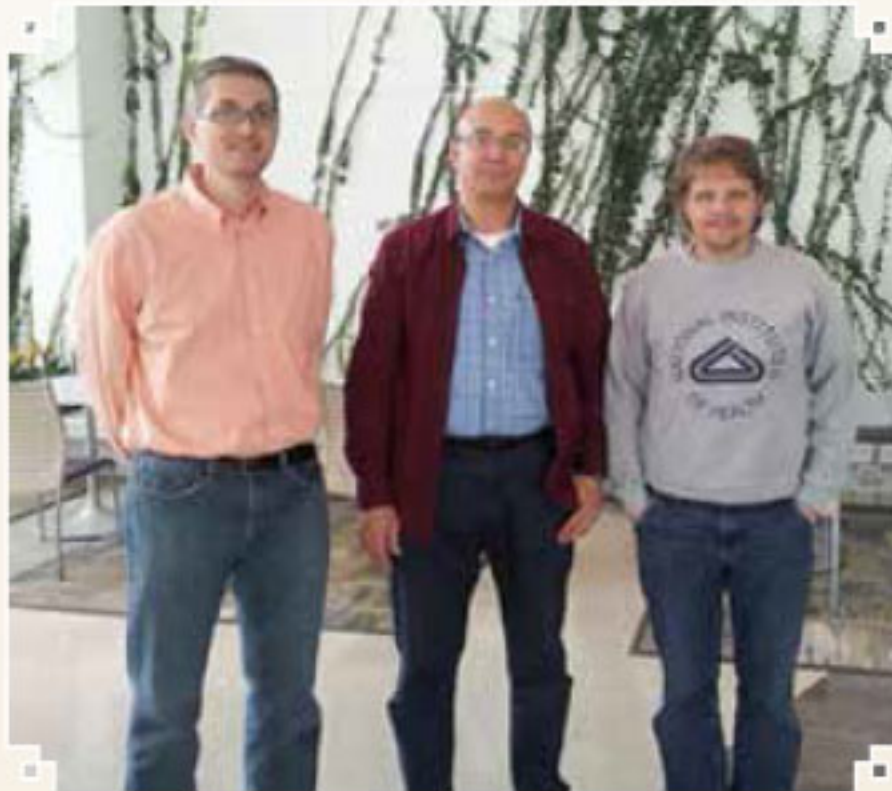
By John Kuhn and H. Lee Woodcock

Providing access to clean water is one of the National Academy of Engineering's Grand Challenges. Two USF professors, John Kuhn of Chemical & Biomedical Engineering and Lee Woodcock from Chemistry, are tackling this challenge. Working in collaboration with scientists in Saudi Arabia (led by Professors Mohamed Barakat and Mohamed Ramadan of King Abdulaziz University, KAU), one of the driest countries in the world, efforts are focused on developing, validating, and applying novel methods of removing harmful metal ions from water.

"The USF-KAU partnership really allows the leveraging of cross-disciplinary strengths that range from basic chemistry and engineering research to the more application / industrial side of the work," explains Professor Woodcock. "Saudi Arabia has water problems we don't even think about. Most of their water comes from desalination plants," Professor Kuhn adds, "and they have to deal with taste, what to do with all that salt, we just don't have those problems here."

One particularly relevant problem is the water pollution from industrial and mining operations; this has global ramifications, as does all research into wastewater treatments. Each university will be contributing expertise on advanced photocatalytic and separation techniques to remove metals like nickel, iron, chromium, and copper from wastewater (common byproducts of electroplating industries, common in Saudi Arabia). "We (USF researchers) are focused on the development, validation, and some initial testing of materials that can efficiently chelate metal ions and ideally be easily recycled for continuous use," says Kuhn "and over there they are doing larger scale engineering tests."

This multi-disciplinary collaboration has already shown signs of success with publications spanning all disciplines (chemistry, chemical engineering, and environmental engineering). One of these efforts (*J. Phys. Chem. B* 115 (46), (2011), 13534–1354) was recently recognized on the KAU side with a university-wide publication award. Other recent studies have focused on improved pollutant photo-degradation rates and effective removal of metal ions produced from the electroplating industry. Ongoing efforts are focused on demonstrating these technologies on real wastewater. "The continued success of USF-KAU efforts is a testament to the need for global cooperation and interdisciplinary scientific and engineering research," states Professor Woodcock, "an area USF is a clear leader."



John Kuhn, Mohamed Barakat, and H. Lee Woodcock during a research meeting at USF.





From Left: Lucia Garsys, Deputy County Administrator, Gita, County Administrator, and Mike Merrill.

**Gita Iranipour**, '02 MSCH, '04 PHD, was recognized by Hillsborough County officials for her efforts mentoring interns and providing students with experiences outside the classroom.

**Mark Mondello**, '87, a COE graduate in mechanical engineering was recently named CEO of Jabil Circuit a FORTUNE 500 company located in St. Petersburg.

COE alumni were honored at the National E-Week banquet Feb. 22. **Joseph Grimail**, '84, founder of Grimail Crawford by the FES Tampa Chapter; and **Ralph D. Painter**, '74, '77 ME, Engineering Fellow by the IEEE. These COE alumni received Young Professional of the Year Award from the ASCE: **Anthony Veiera**, PE, '04, '07 MCE; and from the ASHE: **Whitney Allen**, PE, '04, '05 MCE.

Congratulations to **Sandra Pettit**, '94, '10MCHE and doctoral candidate for being

elected a USF Alumni Association Director representing engineering. Her term is 2013-2015. **Ana Rioja**, '10, '12 MSBME '12, has been cited with Honorable Mention/Alternate recognition by the Ford Foundation Fellowships Program. Ana is a first-year doctoral student in Biomedical Engineering at the University of Michigan, Ann Arbor.

**Trishelle Copeland-Johnson**, '12, has been accepted to the PhD program in the Department of Chemical and Biomolecular Engineering at the University of Delaware (Newark). She will receive a stipend of \$30,000 per year plus full tuition to continue her research in the area of alternative energy.

## Lakecia Gunter '95: A Rising Star at Intel By Tom Edrington

The journey from the small Florida town of Haines City to the high-tech halls of the Intel Corporation outside Portland, OR, has been a story of perseverance, supportive mentors, and success at the highest levels for computer engineering alum Lakecia Gunter.

Gunter came from humble beginnings and has made an impressive climb up the corporate ladder at Intel. Her journey began in an environment that encouraged work ethic and academic achievement. "I was a very inquisitive little girl," Gunter recalled as she looked back on a childhood that saw her develop a love for math and science. "I had a passion for math and science," she explained. "I count my blessings," she continued, recalling her childhood where she saw both good and bad around her.

The good was very good. "My first job was at Kentucky Fried Chicken," she recalled. "I was 14 and the Tinsleys gave me an opportunity to grow as a leader in their franchise, becoming assistant manager as a senior in high school. I learned success principles from the Tinsleys that have been foundational to my career success. It was wonderful to get to know George Tinsley and his wife, Seretha. Tinsley was one of the first minority owners of a KFC franchise and has turned that one store into a mini-empire that includes a diversity of franchises, including TGI Friday's at

Tampa International Airport.

"Mr. Tinsley and his wife continue to be my mentors today," Gunter shared. "They showed what you can accomplish with hard work," she said of Tinsley, a former ABA basketball star.

By the time high school was drawing to a close for Gunter, it wasn't a matter of if she was going to college, it was a matter of where. Her academic success made her a desirable recruit at any school. She chose USF.

"I had several scholarships from other top engineering programs, as well as a four-year Air Force ROTC scholarship available," she said as she looked back to her choices. I was so fortunate to receive the Ronald M McNair Scholarship while at USF. That in itself was a special honor for Gunter. McNair was one of two African-Americans in the space program and his life came to a tragic end aboard the ill-fated space shuttle Challenger.

The McNair Scholars Program is one of his lasting legacies and its motto of "Embrace His Legacy. Create Your Own," held special meaning for Gunter. She had already displayed strong academic potential which is still the basis for recipients of the award. "Without a doubt, the Ronald McNair Scholarship program exposed me to research opportunities as an under-



Lakecia Gunter

graduate student and fueled my desire to obtain a graduate degree," Gunter said without hesitation.

When Gunter first arrived at USF, she thought her career path might lead her to a career in aeronautical engineering. But she got her first computer-related experience in high school and found her way to computer engineering and the path to a bright future began to take shape.

Gunter attributes a lot of her success in the engineering career field to the support she received from the Director of the College's Minority Engineering



Program (MEP) under the leadership of Joy O 'Shields, PhD. According to Gunter, "MEP played a key role in fostering the success and professional development of underrepresented students in the college. Many of whom would never have obtained internships and co-ops or earn their engineering degrees without this support." Dr. O, as she was affectionately called, was more than the director of the MEP program, she was like a surrogate mom to me. She pushed me to go beyond my comfort zone, dream big, and seize every opportunity even if it comes in the form of a job with Hewlett Packard in Corvallis, Oregon!"

Another one of her mentors during her USF days was Samuel Wright, PhD, in Multicultural Admissions, who recently retired after 27 years at the university. He was a friend and advisor to thousands of minority students and Gunter is happy to have been one of them. "He was a great mentor to so many," Gunter said of Wright. Gunter also remembers Joan Holmes, McNair Director, as a big influence during her USF days. Holmes is now at Hillsborough Community College.

Gunter's undergraduate days ended in 1995 when she received her degree in computer engineering and it was then that she went to do her post-graduate work at Georgia Tech. She received her master's degree in electrical engineering in 1996.

She was working for Motorola in Austin, Texas, when it was acquired by Freescale Semiconductor. She did extensive work designing microcontrollers for air bags and anti-lock braking systems and other electronic components for automobiles.

In 2004, she went to work for the U.S. Department of Defense and as a civilian program manager at the Air Force Material Command program housed at Eglin Air Force Base on the outskirts of Pensacola.

"I had a wonderful time there," Gunter said as she reflected back on her work for the Air Force. Her work involved developing weapons systems for fighter jets. The mission was to protect the warfighter, in the air and on the ground, bringing them home safely.

Then one day, Intel came calling. She was being recruited by the huge company, recommended by a friend whose company was acquired by Intel. Intel wanted to fly her to Oregon for a visit. "I'll interview, I said to myself but I'm not moving to Oregon," was Gunter's recollection of her initial reaction to the trip. A company like Intel can be very convincing and it convinced Gunter. She joined Intel in late 2008 and moved to Hillsboro, just outside Portland.

She found an immediate friend, advocate and mentor in the form of engineering manager Pam Lusardi, a 27-year-veteran of the company. Then shocking news came on April 1, 2009 that Lusardi had been killed in a plane crash. "She lived about an hour and a half away, but she commuted by airplane with a former co-worker," Gunter said of her boss. "A lot of folks do that, there's an airstrip across the street. That morning the weather was bad. "It was a shock to all of us," Gunter recalled. "I took it very hard. She was the best manager I had throughout my career; she was very good to me. Her number one goal was to make me successful."

Lusardi's death left a void at Intel and Gunter was asked to fill it. Upper management recognized her talent and her passion for her work. She became manager of the validation engineering team charged with developing the next generation functional test tool, Intel's corporate-wide standard for functional validation. Her team won the Intel Software Quality Award for their work on the Cafe Tool which is used to validate and ensure the overall quality of all micro-processor products produced by the corporation enabling Intel to deliver the highest quality processors to multiple market segments.

Her star was rising rapidly. She was an eager volunteer for the company's affinity groups and community programs, including the United Way. Bigger things were waiting.

She was recently named Technical Assistant for Justin Rattner, Corporate Vice President of Intel

Labs and Chief Technology Officer of Intel Corporation. Intel Labs is the company's world-class, industry leading research organization, responsible for driving Intel's technology pipeline and creating new opportunities. In this role, she assists the CTO and his staff in setting the agenda and establishing technology priorities for both Intel Labs and the company. She is also responsible for all communications and related activities for the CTO. During her career at Intel, she has been involved in diversity recruitment at NSBE and the SHPE conferences.

Gunter's journey had been rapid but she is keeping everything in perspective. "You work hard, build a solid network and reputation, and good things happen," she said. "I look at it as being an extremely blessed person." As a result, she spends time raising the next generation of leaders by mentoring young professionals as well as young girls and boys through her sorority Alpha Kappa Alpha Sorority Inc. and through various non-profit organizations, including an organization she founded while in Fort Walton Beach, Florida.

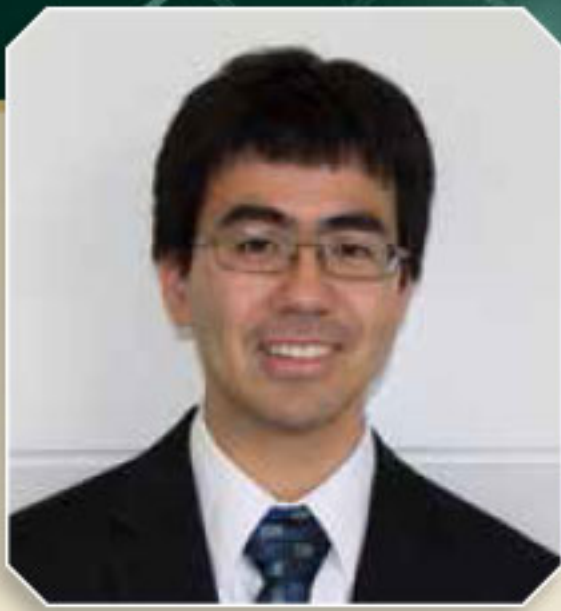
**College of Engineering graduates are doing very well at Intel. Here are some recent alumni who've been recruited by Intel by location.**

**Arizona:** Dorielle Price (MSEE '07 & PhD, EE '12), Tony Price (MSEE '06 & PhD EE '12), Carolina Lopez (BSCHE, '12), Tiffany Burrell (MSCS, '10), Christian Martinez (BSME '08 & MSME '10), Suvodeep Gupta (MSCE '02 & PhD CSE '04)

**California:** Ransford Hyman, Jr. (MS CSE '10 & PhD CSE '11), Aswath Oruganti (MSCE '06), Ranganath Gopalan (MSCE '05), Sandeep Kondapuram (MSCE '05)

**Oregon:** Dinuka Karunaratne (Ph.D. EE '13), Bijith Mankidy (PhD ChE '12), Michael Kubacki (BSCPE '12, BSCS '12), Kranthi Kumar Elineni (PhD ME '11), Keshavanand Jayadevan (MSEE '11), Dabeegu Kabassima (BSEE '06 & MSEE '11), Koustav Bhattacharya (PhD. CSE '09), Harish Jeedigunta (MSEE '04 & PhD EE '08), Raghu Mudhivarthi (PhD, ME '08), Parshuram Zantye (Ph.D., ME '05), Ashok K Murugavel (Ph.D., CSE '03)





## Working to Improve Central Florida Traffic: Kyle Taniguchi, '12 MSCE

By Tom Edrington

**K**yle Taniguchi has done something unheard of by most of today's college students.

He went through four years of undergraduate work at Oregon State University without owning an automobile.

To take it a step further, he made it through more than two years of graduate work at the University of South Florida without having an automobile.

"That's one of the reasons I developed a strong interest for urban transportation," Taniguchi explained. "I didn't have a car as an undergrad and didn't have one at USF while I was working on my master's and that was about two and a half years."

He entered the master's in civil engineering program at USF in the fall of 2010 and received his degree last December. He left a great impression on faculty and fellow students. During his days at the Center for Urban Transportation Research (CUTR), Kyle worked in CUTR's National Center for Transit Research (NCTR).

"Kyle is exactly the kind of student that the National Center for Transit Research at CUTR wants to attract," said Joel Volinski, director of NCTR. "Kyle has a distinct interest in public transportation which allows him to fulfill his genuine desire that everyone have access to all opportunities a community provides in a manner that is environmentally sound."

When Taniguchi began looking for a destination to continue his studies after his graduation from Oregon State, it was CUTR that gained his attention. "I wanted to do public transportation and USF was one of the few schools that had a great program. I visited CUTR and was impressed with the facility and the expertise."

It was easy for Taniguchi to get around during his undergrad days in Corvallis, home of Oregon State. "In Oregon, there are a lot of bicycles and good public transportation. There are a lot of options if you don't have a car," he pointed out.

Tampa was much tougher but he still made it without his own vehicle. And his work as a graduate student attracted a lot of the right kind of attention. In 2011 he was a winner of the American Public Transportation Foundation Scholarship. Then in 2012 he took to the national stage and was named the National Center for Transit Research Student of the Year and was honored at the center's transportation conference in Washington, D.C.

"There were 11,000 people attending from the United States and all over the world," Taniguchi recalled. "It was a five-day networking conference and I was one of over 45 students to receive the honor."

After he successfully completed his coursework, Kyle found a position waiting for him at the Orlando offices of Vanasse, Haugen, and Brustlin, Inc.

The planning, design and engineering consulting firm has some very high profile projects on its books. Taniguchi is involved in several, including the

US 192 alternatives analysis plan in Orlando. "It's a big transit project," Taniguchi said. "I'm working on incorporating bus rapid transit in the corridor by planning where stations might go and developing plans for incorporating them within the existing roadway right-of-way."

He's also hoping to be more involved with his firm's work with the SunRail Commuter Rail Transit Project. It's a 61-mile commuter rail system from Deland to Poinciana. They're involved with permits and rail infrastructure design.

"We are working on the big picture for Florida and I like that," Taniguchi said. "But I also like the smaller projects we have as well. I'm working with transportation circulation problems involving traffic at a private school in the Cayman Islands." The work is challenging and it makes him happy. Kyle Taniguchi has come a long way from his home in Hawaii.

The work he is doing will help impact Florida for years to come and he is one of the great success stories from the College of Engineering. He's the product of the quality environment that CUTR provides to students who look to the future of our state's transportation problems and solutions.

Kyle still keeps those memories from his days in Oregon, where there are seemingly more bicycles than cars. And he still enjoys the fact that he made it through graduate school and without owning a car.

But now there is a post-script to Kyle Taniguchi's journey. He now owns his first automobile, a fuel-efficient Toyota Corolla.



**Bermanley Augustin**, a senior (EE) received the 2013 Black Engineer of the Year (BEYA) Student Leadership Award during the 27<sup>th</sup> Annual BEYA STEM Global Competitiveness Conference in February in Washington, DC..

A team of three electrical engineering graduate students – **Frank Alexander**, **Justin Boone** and **Mike Grady** – took second place in the 2012 IEEE Microwave Theory & Techniques Society Video Contest for their video titled “**Mario Teaches Microwaves.**”

At the Society of Hispanic Professional Engineers Annual Conference **Oscar Peña**, senior (civil engineering), received the first place award for his poster titled “Effect of Ammonia and Sodium on Thermophilic Anaerobic Digestion” during the Technical Paper/Poster Competition. His research is supervised by **Sarina Ergas** and **Jeff Cunningham**, professors in the Department of Civil and Environmental Engineering. A four-student team including **Peña**, **William Gonzalez** (Industrial Engineering), **Giorgio Grassi** (Chemical Engineering), and **Leslie Rodriguez** (Computer Engineering) placed first in the Academic Olympiad Competition. The Olympiad is designed to test the technical knowledge (engineering, mathematics, and science) of SHPE Student Chapter teams from across the nation.

Student groups **LogikLabs** and **IEEE Student Chapter** hosted the Fall 2012 Microcontroller Conference November 17-18 on the Tampa campus. The conference theme was “Introducing Technology for Advancing Education” (ITAE) and its goal was to enable students to gain a greater understanding of technology through microcontrollers. The following COE student groups were the top three winners:

- First Place – “S<sup>3</sup> Super Science Squad” (**Shawn Gicka**, **Sean Murphy**, **Shaune Reynolds**)
- Second Place – “The Null Pointers” (**Benjamin Roedell**, **Jeffry Price**, **Alex Brown**)

- Third Place – “ZmeyGorynych” (**Denys Kukushkin**, **Elisha Stevenson**, **Daniel Yordanov**)

**Sandy Pettit**, a doctoral candidate (Chemical Engineering) earned first place in the Graduate Collegiate Technical Poster Competition during the Society of Women Engineers National Conference (SWE12). Pettit presented on “Photocatalytic Oxidation of Aqueous Organic Contaminants by Semiconductors Using Visible Light Radiation.” **Pettit** and **Selma Hokenek**, a doctoral candidate (Chemical Engineering) were two of ten finalists selected nationwide for SWE’s Graduate Collegiate Technical Poster Competition. Both are advised by **John Kuhn**, assistant professor.

The USF student chapter of **INFORMS** received the Summa Cum Laude INFORMS Student Chapter Annual Award for the year 2011-2012, the highest recognition among all INFORMS Student Chapters worldwide.

**Matthew Morrison**, ‘10, ‘12MSCP and computer science and engineering doctoral student under Distinguished University Professor Nagarajan Ranganathan, received the Provost’s Award for outstanding teaching by a graduate teaching assistant.

**Frank Alexander, Jr.**, electrical engineering doctoral student received an NSF ASEE Fellowship.

**Olukemi Akintewe**, chemical engineering doctoral student received a UNCF / Merk Graduate Fellowship

**Camille Ramseur**, junior in the Computer Science and Engineering Dept. received an NSF REU award to intern this summer at the University of Pennsylvania’s General Robotics, Automation, Sensing, and Perception Robotics Laboratory.

The USF **American Institute of Chemical Engineers** received the AIChE Outstanding Student Chapter Award for 2011. This national award is presented annually to the student chapter that shows an exceptional level of participation, enthusiasm, program quality, professionalism, and involvement in the university and community.

**Bryce Hotalen**, a senior majoring in electrical engineering received an IEEE Microwave Theory and Techniques Society (MTT-S) Undergraduate/Pre-graduate Scholarship for spring 2013.

**Ibrahim Nassar**, a doctoral student in electrical engineering in the Center for Wireless & Microwave Information Systems, received an IEEE Microwave Theory and Techniques Society (MTT-S) Graduate Fellowship for spring 2013.

These College of Engineering students received 2012 Student Engineer of the Year Awards from the National Engineers Week Foundation:

American Institute of Chemical Engineers seniors **Justin Stottlemeyer** and **Giovanni Quiel**

American Society of Civil Engineers: senior **Stephen Kovach, Jr.**

American Society of Mechanical Engineers: junior **Mason Chilmonczyk**

Florida Engineering Society, Tampa Chapter: senior **Bradley Updyke**

Institute of Electrical and Electronics Engineers: senior **David Touvell**

Society of Women Engineers: senior **Feleshia McCutchin**

**Trang Luong**, a sophomore in civil engineering, has been awarded a DAAD RISE internship position on a civil engineering project in Weimar, Germany during the summer of 2013. She will be joining a research group of Ph.D. students at Bauhaus-Universität Weimar. Luong is one of only 300 students to receive a position this summer out of more than 2,000 applicants. She is the first international student at USF to win a national scholarship.



**Miguel Labrador**, associate professor in the Department of Computer Science and Engineering is the recipient of the College of Engineering's 2012 Outstanding Research Achievement Award. In 2012, Miguel was part of an interdisciplinary research team that received seven patents pertaining to wireless technologies.

These patents cover a wide range of applications such as an emergency reporting system, a ride matching system, and a travel assistance device, among others. The travel assistance device is now used in a commercial application. His research has attracted REU students from all over the United States and Latin America to USF and has provided a rich environment for nine doctoral students who have graduated under his guidance.

Department of Computer Science and Engineering professors **Nagarajan Ranganathan** and **Lawrence Hall**, who also serves as department chair, were named Fellows of the American Association for the Advancement of Science (AAAS). Election as an AAAS Fellow is an honor bestowed upon AAAS members by their peers. Hall was elected an AAAS Fellow (Information, Computing & Communication section) for outstanding contributions to scalable pattern recognition. Ranganathan was elected an AAAS Fellow (Information,

Computing & Communication section) for distinguished contributions to the field of computer science and engineering, particularly for the development of algorithms and architectures for VLSI systems and applications.

Four professors and two retired professors were honored at the annual USF Faculty Honors & Awards Reception hosted by President Judy Genshaft on November 26. The following professors were recognized at the reception.

**Yogi Goswami**, professor in the Chemical and Biomedical Engineering Dept. and co-director of the Clean Energy Research Center received the Distinguished University Professor honor.

**Alex Savachkin**, associate professor of industrial and management systems engineering, and **Rasim Guldikin**, assistant professor of mechanical engineering, received Outstanding Undergraduate Teaching Awards.

**Scott Campbell**, professor of chemical and biomedical engineering, received the Jerome Krivanek Distinguished Teacher Award.

Two retired faculty were granted the Emeritus designation. Those professors are:

**Abraham Kandel**, professor, computer science and engineering

**Dewey Rundus**, professor, computer science and engineering

**Sudeep Sarkar**, professor in the computer science and engineering department has been named an IEEE Fellow. He is being recognized for his contributions to the field of computer vision.

Mechanical Engineering Assistant Professor **Rasim Guldikin** received the 2012 Engineer of the Year Award from the American Society of Mechanical Engineers during National Engineers Week.

**Venkat Bhethanabotla**, professor and chair of Chemical and Biomedical Engineering Department, was named a Fellow of ALChE.

**Richard Gitlin**, NAE, professor of Electrical Engineering, named a Charter Fellow at the National Academy of Inventors.

## *In Remembrance*



### **Wayne Echelberger, PhD**

Professor Emeritus and former Chair of the Civil and Environmental Engineering Department.

Dr. Echelberger passed away unexpectedly on January 19 in Indianapolis while visiting family and continuing his service to the Triangle Fraternity Education Foundation. He served the College from 1989-1999.

Wayne was a generous benefactor to the college and active within the academic engineering community. May he rest in peace.





The newly renovated Hall of Flags will carry the name of Tampa Armature Works, thanks to a \$150,000 gift made by J.A. "Bubba" Turner, III, president. Mr. Turner is a friend of the college and a member of the College of Engineering Advisory Board. Mr. Turner's grandfather, J.A. Turner, Sr., was instrumental in establishing USF as a state university.

Rosalee Roberts established the **Jack W. Roberts** endowed scholarship fund in civil engineering in memory of her late husband.



The Tampa Post of the Society of American Military Engineers established an endowed engineering scholarship.



Bracken Engineering will support the Bracken Engineering Lecture Series at the College of Engineering. Bill Bracken, '89, '94 MSCE, president, is a member of the College of Engineering Advisory and vice chair of the Florida Board of Professional Engineers.

Bracken is also a generous contributor to the Engineering II renovation at the Emerald level of \$25,000+. When the lecture series list of speakers is finalized, alumni will be notified by email.



Annina Donaldson with SAE past president Simon Restrepo

Annina Donaldson, vice president of Maxi-Blast, came to campus to sign a five-year pledge of support for the Society of Automotive Engineers at USF.





Photos by Ryan Wakefield  
College of Engineering



The Engineering Alumni Society held its annual Bullarney fundraiser "A Night at the Casino" on March 23 at the Glazer Children's Museum in downtown Tampa. The event raised more than \$25,000 for scholarships and conference grants for engineering students.



Use your phone's QR reader to view a Bullarney Event photo slideshow.

## Engineering expo 2013

USF's College of Engineering held the 41st Annual Expo in February. Engineering EXPO educates K-12 students on the importance of math, science, engineering and technology. EXPO features hands-on exhibits and presentations that help encourage more students to pursue fields in science and mathematics. This year an estimated 20,000 students, teachers and parents visited EXPO over the two-day event.



Photos by Ryan Wakefield | College of Engineering

## 20th Anniversary Heart of Gold

### Save the Date October 4, 2013

Each fall, the College of Engineering holds its annual Heart of Gold Scholarship Luncheon. The luncheon provides student recipients with an opportunity to meet the donors who support them. Without the generosity of these benefactors, many of these students would not be able to achieve their full potential both academically and professionally.



COLLEGE OF ENGINEERING at the  
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## **USF: UNSTOPPABLE** **College of Engineering**

Dear Friends,

Since this is my first Envision article, allow me to introduce myself. I am the co-director of development, working side-by-side with Beth Fontes. If you are reading our Envision magazine, then I suspect you consider education to be important. So do I, and the more I become immersed in the College of Engineering the more I am energized by both the content and approach of the engineering degree.

The USF College of Engineering is dedicated to creating engineers who solve society's problems, transform ideas into reality and generate prosperity that improves the quality of life. As a state-assisted institution, rather than a state-supported one, our college relies on state appropriations for basic operating costs. The vital resources that attract top students and faculty, support new research endeavors and enrich the college's innovative programs all depend on private support.

Our College of Engineering requires qualified and dedicated personnel, modern equipment, adequate facilities and strong constituent support that recognize the value of engineers to society. We are teaching a new generation of engineers to become problem solvers and lifelong learners that produce a mindset that applies to anything that needs solution or innovation.



Major Alston  
*Director of Development*

This is why I am so proud to work with the college's leadership to secure philanthropic investments that will propel the College of Engineering forward. We exist today, and are able to have great impact, because of individuals with vision and foresight to invest in the future. Financial contributions from friends, alumni, industry and foundations make the college great and enable us to touch the lives of many. Your support makes a difference in engineering research in the Tampa Bay community, throughout the region and around the country. You, the contributor, ensure that the college reaches its full potential in serving students and community.

A very generous donor to the College of Engineering told me that there are many great causes to support, but he focuses his philanthropy primarily on higher education because that is where we find solutions to problems facing the world and a strong educational system is crucial for the success of future generations.

We consider your gift an investment in excellence, and we are committed to being good stewards of your contributions. We appreciate your consideration, and we hope that you become a member of the College of Engineering family and join our very important mission. My teammate, Beth Fontes and I look forward to working with you to ensure that the College of Engineering remains UNSTOPPABLE!