



A Fourth Engineering Building Could Soon Become a Reality

Page 3

John Ramil

USF Alumnus John Ramil looks back on a lifetime at TECO and USF.

Page 32

Engineering Excellence Awards

Alumni honored for their engineering contributions.

Page 18

Kumar Ramachandran

Outstanding alumnus and social entrepreneur.

Page 26

June 2016

Envision is produced by the College of Engineering at the University of South Florida.

Editor: Janet Gillis MSM '00
Writers: Glenn Cook
Janet Gillis
Photography: Ryan Wakefield
Chen Wang
(Sweet Lighting Photography)
Designed by: Ryan Wakefield

MISSION STATEMENT

The mission of the College of Engineering at the University of South Florida is to profoundly shape and impact lives through the steadfast pursuit of world-class engineering, research, education, and innovation.

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@usf.edu



WITH A SOLID FOUNDATION, IT'S INCREDIBLE WHAT WE CAN BUILD

After 50 years of pursuing excellence in engineering, we can afford to pause—but just for a moment—to reflect on our triumphs and struggles. For our community partners, students, and faculty, the College of Engineering has been a beacon of education, opening doors of opportunity and revealing infinite possibilities for a better world. I am proud of our achievements. However, the fields of engineering and education are ever-evolving—and there is still much more to accomplish.

As a college, we can best be described as young in spirit. The advantages are evident in our optimism, confidence, and innate drive to aim higher than others think possible. Our tools and technology contribute to space exploration. Create fuel from landfill gases. Save lives in hospitals and operating rooms. Provide safer

roads and effective transportation systems. Purify water and deliver it to those in need. Enhance domestic security. Yet, we are capable of even larger feats. So, each day, we work harder—relentlessly and creatively shaping our understanding of mathematics and science for the greater good. And proving again and again that we, as engineers and students, have the will and power to directly and positively impact the world around us.



Photo: Chen Wang | Sweet Lighting Photography

The success of our students, research, and multidisciplinary solutions is a reflection of both the quality of

education we offer and the rate by which we balance change with adherence to our foundational ideals. Through educational leadership, impactful discovery, experiential learning, and community partnerships, our plans for the future—for a new facility—are within reach. A facility that allows intellectual collaborations and collisions to take root and thrive. And that enables the College of Engineering to not only grow in size and strength, but to push the realm of what's possible in engineering and education.

Robert H. Bishop, Ph.D., P.E. Dean, College of Engineering



▲ It's important to note that the illustrations shown here and on the cover do not necessarily represent what Building IV might actually look like. There are several concepts under consideration.

College of Engineering Unveils its 2025 Strategic Plan

With a new 10 year road map, the college is placing emphasis in four critical areas. Read the complete plan here:

www.usf.edu/engineering/about/index.aspx



Experiential Learning

Engineering cannot be learned from the pages of a textbook. That's why, with an emphasis on capstone projects, internships, technology, and highly specialized labs, our goal is for all students to grow through experience.

Impactful Discovery

Engineering is often viewed as a means to an end. An idea is generated. A process is followed. And, finally, a product is produced for monetary gain. This oversimplification, however, does little justice to a profession with a robust history of innovation and human service.

Community Partnership

One look around reveals the countless ways engineering has shaped the world as we know it. To bring diverse partnerships and service to the forefront of students' educations, we will strengthen our ties with both local and global communities.

Educational Leadership

To an engineer, solutions are never complete—there's always room to improve. It's time to push our vision onward and upward, creating an even greater era for the College of Engineering—one that is truly transformational for the university, our students, and the impact of our research and discovery.

We're Building More than a Building

Over the past five years, enrollment numbers in engineering have grown dramatically to more than 5,500 students – an increase of more than 20 percent. This kind of growth requires increased faculty numbers and that translates to space. But the college is out of space for more faculty, classrooms, laboratories, administration offices.

While renovations to the Engineering II building, Glenn A. Burdick Hall, are ongoing, it's not enough to meet the needs of our burgeoning growth. The proposed building is about creating an environment. We envision the new space to be a place of interaction and inspiration full of transparency and light with a connection to nature. It will contain places for gathering, research and learning and an environmental steward.

Setting our sights on a new 250,000 square-foot state-of-the-art facility is no small feat, especially considering the tremendous amount of resources and financial support needed.

As we head into the next decade and lay the framework for our fourth facility, we envision a design that encompasses shared workspace, integrated research opportunities, and cutting-edge teaching laboratories. Despite these modern features, it's not the building's physical footprint that sets it apart from others. Rather, it is how we use the space that matters: the ideals we steadfastly build upon and execute faithfully, day in and day out. Only then, through something so ordinary as a blueprint, will we achieve the extraordinary.



Merging International Relations and Engineering has Broadened Her Horizons

By Glenn Cook

In high school, Colleen Naughton hoped to find a career path that would merge her interests in international relations and engineering. Thanks to a USF program that allowed her to get advanced degrees while performing public service abroad, she's done just that.

“In high school, I thought I had to make a choice of one or the other, but I leaned toward engineering because I've always wanted to solve problems instead of talking about them,” says Naughton. “Thanks to USF and the Peace Corps International Program, I've been able to find a way to combine engineering with public service.”

Naughton worked in Ghana and Costa Rica while attending Purdue University as an undergraduate, then was accepted into the Peace Corps Master's International Program directed by USF professor James R. Mihelcic. The program allows qualified students to work on a master's degree while serving two years in the Peace Corps.

“It was great to get more preparation for my PhD because I was able to do my master's and research at the same time,” says Naughton, who focused on clean water sanitation stations in Mali, West Africa. “It was an amazing experience, learning a new language and working in the developing world.”

▲ Colleen Naughton graduated in May with her doctorate in Civil Engineering. She wears a traditional Malian dress given to her in Mali, West Africa.



In the section of Mali where Naughton worked, 700 people do not have electricity or running water. The child mortality rate, especially for those under 5, is high, as is the number of illnesses and diseases spread by poor sanitation. With the Peace Corps, she helped install 60 hand washing stations between villages and worked to educate the community about the need for proper hygiene.

“I really learned a lot about behavior change, community engagement, and integrating to a new country and culture by living there and becoming part of the community instead of just reading about it,” she says.

After returning to USF to pursue her PhD, Naughton went back to Mali in the summers of 2013 and 2014 to continue her research. Her recommendations for improving the community’s health, including a focus on educating women about the stations’ effectiveness, were published in the *International Journal of Water Sanitation and Hygiene*.

“Gender does have an impact on the use over the long term, but it really depends on how empowered women are,” Naughton says. “We also learned we need to promote hand washing much more among poor households. We were told that many people don’t do it because they can’t buy soap, but they were much more open to it when we told them they can use ash.”

Naughton’s second Mali-focused research project looked at the country’s growing shea butter industry. An ivory-colored fat extracted from the nut of the African shea tree, the butter is widely used in cosmetics as well as food preparation.

“The process is controlled by women, and they use the profits from selling the butter to buy greens for the household and for their children to go to school,” Naughton says. “However, it is a very labor intensive process, and there is a lot of human energy involved. Because of the amount of firewood used, there are also a lot of CO2 emissions and deforestation issues that we have to worry about.”

Women are not properly compensated for their labor, Naughton says, and through interviews with workers, she learned a great deal about their struggles while developing recommendations about ways to improve the industry.

“It has a lot of potential as an international export, and because this is an industry that is primarily run by women, it’s important that they understand how they can get reimbursed properly for their work and manage to do so in an efficient manner,” she says.

Naughton’s work in Mali further developed her passion and desire to help other women, especially those interested in STEM fields. At USF, she helped start the university’s chapter of AAUW - American Association of University Women.

“Only 15 percent of graduate-level engineers are women, and we wanted to create more of a sense of community,” she says. “AAUW has a broader impact than women’s involvement in STEM education. They pay more attention to advocacy for women in all fields, and we want to broaden our chapter’s reach and grow it beyond just the college.”

Naughton says participating in USF’s program broadened her horizons in ways she would not have imagined a decade ago.

“It wasn’t until I got here that I understood engineering’s application to the developing world and sustainability,” she says. “Here I’ve taken anthropology and public health classes, and I’ve been encouraged to take an interdisciplinary approach to my chosen field.”

“The faculty here has been extremely supportive of me gaining experiences in a lot of different areas,” Naughton says. “I hope to apply a lot of that when I work for a university, and use my experience here to get more women involved in engineering. I believe it can be done, especially if they can see the aspect of connecting engineering to more public service fields.”

Photo: Ryan Wakefield





▲ NASCAR driver Matt Kenseth checks out SAE's Formula One-style race car from behind the wheel.

Photo: Ryan Wakefield

NASCAR Driver Matt Kenseth Visits the SAE Garage

Compiled from a story written by
Hillary Lehman, MUMA College of Business

Matt Kenseth, a two-time Daytona 500 Champion and driver of the No. 20 Dollar General Toyota Camry for Joe Gibbs Racing, and Joie Chitwood III, president of Daytona International Speedway, spent the afternoon on USF's campus on February 11, visiting both the College of Engineering and Business.

Kenseth was in his element in the USF Racing garage,

where he and Chitwood met members of the Society of Automotive Engineers. The mechanical engineering students build Formula One-style race cars from the ground up, entering the vehicles in competitions that gauge not only how fast the cars can go but also how well-designed they are according to technical specifications.

The society competes in at least two competitions a year



and is the largest USF-funded student organization that is not sports- or medicine-related. The group is open to students from all disciplines, from public relations to accounting to physics, to handle multiple facets of the organization because it runs like a small business.

The students talked with Chitwood about finding places to test their cars, and he told them if Daytona were closer,

he would let them test on the speedway. Instead, he offered them tickets and garage passes to a Saturday race. He also gave them a quick business lesson about how they could use this opportunity to their benefit: meeting with racing celebrities is marketing collateral, which can lead to more sponsorships, which leads to more resources, which leads to better competition finishes.

USF Teams of Engineering Students Take First at Florida Water Resources Conference

At the recent 2016 Florida Water Resources Conference, both teams of University of South Florida civil and environmental engineering students won first prize (in the wastewater and environmental divisions). The conference was held in April at Gaylord Palms Resort in Kissimmee, FL. The Florida Water Environment Association Student Design Competition is intended to promote “real world” design experience for students interested in pursuing an education and / or career in water engineering and sciences. This year the students worked on projects for the City of Plant City. The winning teams will now compete at a national competition in New Orleans in September.

The two winning teams were:

Supplementary Sludge Management (Solar Drying) Process for City of Plant City Water Reclamation Facility Rebecca Braz (Project Manager), Krystin Kadonsky, Poe Poe Min Hlaing, Christin Gentz, Maria Reed .

Developing Solutions for the City of Plant City’s Water Reclamation Facility to Handle Increased Septage Loads Due to the Ban from FL SB 550 Monica Resto (Project Manager), Dillon Forsyth, Wainella Isaacs, Madeline Kender, Jonathan Knudsen, Vittoria Zucchelli.



Engineering Students Gain Valuable Experience with Northrup Grumman Internships

By Glenn Cook

For students in the College of Engineering, a strong internship experience is an invaluable opportunity to get practical experience, impress potential employers, and learn something about life after graduation.

Two engineering students, Jonathan Franco and Carlos Oquendo, spent the summer of 2015 working for Northrup Grumman Corp. Oquendo was hired by the company after he graduated

last December, while Franco returned to school with a much clearer perspective on what he needed to take for

“I was able to apply what I learned in school to real-life problems and that made my experience much more valuable.”

— Carlos Oquendo

his senior year. “It was by far one of the best experiences I’ve had,” says Oquendo, who received his degree from the Department of Computer

Science and Engineering.

“I was able to apply what I learned in school to real-life problems and that made my experience much more valuable.”

Franco, who is studying mechanical engineering, worked with the systems engineering team at two Northrup Grumman sites in Bethpage, N.Y., and Melbourne, Fla., during his three-month internship. “I had a great time,” Franco says. “I learned a lot from





different engineers and got a better idea of what I want to do with my career. You can't learn everything in the classroom, and it was good to see how everyone works in teams to make projects run. For me, it was about getting relevant job experience, and then going back to school and making the most out of what I had learned."

Oquendo's internship centered on working with electronics that are used in satellites. He also was tasked with developing a transistor that would have higher head dissipation than the standard ones currently used.

"Once my designs were complete, my manager sent them to be fabricated and tested. I feel like my work made a difference in the company," he says.

Franco had very different experiences at the two sites. In New York, he worked with a small group of eight interns, while in Florida he was part of 120. His primary task was working on an updated interface control document for Northrup Grumman's Littoral Combat Ship. He also analyzed and plotted aircraft data and helped create a unit converter.

"It was a good task because I was able to use a program that I had learned in school to analyze real-life data to be able to see the application aspect of what we are taught," he says.

Going into the internship, Franco still had 11 engineering classes remaining before he graduates this fall. Talking to other interns, as well as the Northrup Grumman engineers, he was able to better schedule his remaining coursework when he returned to USF.

"I learned a lot, both from the internship itself and in transitioning from one place to another," Franco says. "When I came back to school, I was much more focused on the next steps as I move toward my career."

This summer, the next step for Franco will be another internship. He is scheduled to work

“ I learned a lot, both from the internship itself and in transitioning from one place to another.

- Jonathan Franco

in operations engineering for Eaton Corp., a multinational power management company.

"I really like the aviation side of engineering, and I wanted to see something else that was a little different. With Northrup Grumman, you are working in defense with a security clearance, and you learn things on a need-to-know basis," he says. "I wanted my second internship to be with a company without as many restrictions.

"That's the benefit of having multiple internships," Franco says. "Because I started them in my junior year, I'm in a position where I'm able to pick and choose what I want to do, and determine what will best position me for the future. I would tell anyone to take that route if they can."



USF Alum Helps Commercialize Space Travel

By Glenn Cook

Growing up 45 minutes from the USF campus, Tyler Isaacs “tinkered” his way through childhood.

“I’ve always loved math, and I was always building things in the garage,” says Isaacs, who grew up in New Port Richey and received a bachelor’s degree in mechanical engineering in December 2015. “I loved Legos, K-Nex, erector sets. I loved to work on cars and build treehouses. I really enjoyed the hands-on things, and understanding problems using math and physics to come up with solutions.”

Now he uses those skills, as well as others gained at USF, to help develop next generation commercial space travel for Blue Origin, a privately funded aerospace developer and manufacturer founded by Amazon’s Jeff Bezos. As a rocket test engineer, Isaacs is working with Blue Origin’s engine design and facilities teams to build test facilities that can handle the company’s rocket-powered Vertical Takeoff and

▲ Tyler Isaacs poses in front of NASA’s Neutral Buoyancy Lab.

Vertical Landing (VTVL) vehicles.

“As we’re developing a new 550K thrust engine, we’re having to expand and elaborate on the test stands we currently have and make sure we have all the facilities in place that we will need leading up to our first full-scale engine hot fire test,” Isaacs says. “We also are doing a lot of testing to make sure that the engines we have can be reused, so I’m doing a lot of fundamentals of engineering work. The days seem to go by quicker and quicker. It’s really been incredible.”

“Incredible” is a word Isaacs uses often to describe the experiences he’s had over the past year. It also could describe his path to USF and Blue Origin.

In seventh grade, Isaacs received a “Take Stock in Children” scholarship designed to help low-income,



academically qualified students receive up to 120 post-secondary credits. Despite the financial reassurance, Isaacs says he wasn't prepared for college right after high school.

"I wanted to make sure I made the most of this opportunity, and I knew I wasn't ready," he says.

Isaacs worked at Publix and at "a small mom-and-pop" machine shop. He later enrolled at St. Petersburg College, where he took physics and engineering classes and was "hooked" on mechanical engineering. After two years, he transferred to USF and commuted to campus.

"I was working at the machine shop, around engineers at school, and I was building things with metal and structures," he says. "I was lucky enough to get my hands dirty, while at the same time finding myself on the ground floor at the university and learning who to talk to. It was a great way to start and I kept growing with it."

““ People don't realize companies like Blue Origin even exist because commercialized space travel is so new.

- Tyler Isaacs

USF student teams that participated in NASA's Microgravity University. Called Micro-g NEXT, the program challenges students to work in teams to design and build prototypes of tools that address current space exploration problems.

Isaacs' team, which designed a tool that could create and collect rock chip samples from asteroids, was one of 19 nationwide picked for the test operation, held in August 2015 at the Neutral

In the spring of 2015, while taking a Bioastronautics class taught by Mechanical Engineering professor Stephanie Carey, Isaacs was selected to be on one of three

Buoyancy Laboratory at Houston's Johnson Space Center. Lab scientists evaluated a prototype of the team's tool during underwater sampling events that were designed to mimic spacewalk on an asteroid.

"It was incredible just getting there," Isaacs says. "The moment you walk into the JSC lab, you are overwhelmed by the size of it. Then you go on the pool deck and there is a one-to-one model of the entire space station so you can get a feel of what happens there. There was an overwhelming sense of being a kid in a candy store for me."

Isaacs called the program "life changing" because of its effect on his resume and the connections he developed. He returned to USF for his final semester even more determined to work in the aerospace industry. But he didn't know about Blue Origin until his father read an article about the company in the Tampa newspaper last fall.

"People don't realize companies like Blue Origin even exist because (commercialized space travel) is so new," says Isaacs, who started with the company in January. "When I started looking into them, I saw that our vision and goals aligned in a way that was unlike any other aerospace commercial company out there."

After moving across country to the company's headquarters in the Seattle area, Isaacs is traveling between Washington state and Blue Origin's sites in Texas and Florida

"I love it," he says. "They have a passion about commercializing this industry. The way they present their views on space and space travel is just, well..."

Here's that word again: "Incredible."

Alum Wendi Gooding Williams is Sirius About Engineering

By Glenn Cook

If the USF College of Engineering had a TV show in the 1980s, you could have called it “The Gooding Girls.”

Dolly Gooding, an industrial engineering faculty member for more than 30 years, often brought her three daughters — Jodi, Wendi, and Cindi — with her to work. Jodi, the oldest, and Wendi, the middle child, later received engineering degrees from the university.

“We grew up with the university,” says Wendi Williams, a 1991 electrical engineering graduate. “The university was very new at the time and we grew up together. I played with and knew Cecil the Robot and rode in the Old Baker in the Gasparilla Parade. We used to help out and take part in engineering expos, and we’d play

on the typewriters before they had computers. It really was my second home.”

Today, Williams is Vice President of RF IC for Sirius XM Radio, supervising a team that is working on next generation technology in Deerfield Beach, Fla. She has been with the satellite radio company since shortly after it launched as XM Radio in 2001, and has seen it grow from 30,000 to 30 million subscribers.

“It’s been a great ride, and we’re working with multiple companies right now to further expand the products we offer,” she says. “The risk is high, and we’re pushing the limits, but it’s an exciting time to be doing this.”

▶ USF alum Wendi Williams



From Motorola, a Giant Technology Leap Forward to XM Radio

Williams has seen seismic changes in her field in the 25 years since leaving USF. She spent the first decade of her career at Motorola, where she worked as a radio frequency engineer designing pagers and cellular phones. During college she co-opted at GTE Mobilnet and helped develop the first cellular network in Florida.

“Everything I did first out of school was at the discreet level. We had a separate oscillator, mixer and amplifier and we were putting a whole bunch of components together,” she says. “You had 14 radio frequency engineers working on a cell phone. Now it’s all in one chip and everything is pretty much integrated.” Williams says she was fortunate to work with Motorola during

the company’s “heyday” in the years before the release of the iPhone and Android platforms, which put a personal computer into a user’s hand. But in early 2002, she “saw the writing on the wall.”

“Motorola was making poor decisions. The business was changing. I heard they would eventually close the facility, and started looking. There was this startup, XM Radio, that interested me, but my kids were still young,” she says. “I told them, ‘If you need someone working and traveling 24-7 I can’t do that.’”

XM agreed to hire Williams anyway and she was “out the door

everyday at 5:15” to pick up her children, Jessica and Casey from daycare. She helped design the company’s first aftermarket radio, automotive module receivers and antennas, then gradually moved into management.

“I spent 15 years on the bench,” she says. “Motorola tried to get me to go into management early in my career, but I wanted to stay technical, so I stayed on the bench. I enjoyed being hands on in the lab, but I eventually had to let go of the bench so I could understand the aspects and complexities of running programs.”

In her current role, Williams manages a team of radio

frequency engineers. The team’s projects include integrate circuits and module design for cars and various vehicles equipped with the satellite radios, as well as after-market products sold at retailers such as Best Buy. Since Sirius and XM merged in 2008, the company has become one of the largest vehicle service providers in the U.S.

“We work on radio frequency chip sets,” she says. “We create the specifications for the design of the chip and then hand it off to a company that designs them for us. They are fabricated overseas in Asia and we serve as the checks and balances all along the way. It’s exciting because we are the team that comes up with the idea, then actually creates it and makes it into a product.”

She Grew up Surrounded by Engineers

◀ Wendi Williams (left) walks with her mother Dolly, older sister Jodi and father Bert in front of the Kopp building (1970).



In addition to her mother, Williams “was basically surrounded by a bunch of engineers” growing up in Clearwater. Her late father, Bert, worked as an industrial engineer at Florida Power and many of the family’s friends also worked in the engineering field.

“With two sisters and no brothers, we learned all the things boys typically would learn,” Williams says. “My best friend’s father was an electrical engineer, and I decided in middle school that I wanted to do that. It was exciting to hear what he did at his job and it interested me. When I went

to school I started gravitating in that direction.”

Dolly Gooding was attending USF when she became pregnant with Wendi. She waited until her children were in school before finishing her industrial degree, then taught at the university from 1976 to 2009.

“The university has always been part of my life. It became my second home with my mom working there for so long,” Williams says. “When I got to the university, my professors knew me as Dolly’s daughter.”

Today, Williams' 21-year-old daughter, Jessica, has broken with tradition and is a junior in pre-med at Washington University in St. Louis, but recently submitted her application to the USF Medical School. Niece Allison Peacock is in the USF nursing program. The family's bond with engineering likely will continue when her 18-year-old son, Casey, goes to college this fall. "Casey wants to study mechanical or software engineering," she says. "He's applied to USF among many universities and should do very well in engineering because he's really brilliant in math. His father is a Gator, though, so I'm not sure where he will ultimately wind up."

Williams says she and her sister, Jodi, did not feel pressure going to a college where her mother taught. At USF, Jodi met her future husband, George Patton, while both were earning civil engineering degrees. Jodi's son just graduated with an aerospace degree. Her younger sister Cindi works for an industrial distribution company. "Sometimes people would get me confused with my sister since we looked alike," Williams says. "I was really lucky to have my family around me. I was able to go to lunch with my mom and able to live with her while I was in college and I have USF to thank for it. The university really is part of my family."

Engineering is Slowly Changing — But Still Male Dominated

When Wendi Williams was an electrical engineering student at USF in the late 1980s and early 1990s, she often was the only woman in her classes.

"Sometimes there would be only one female in a class with me, but more often than not I was the only one," says Williams, who followed in the footsteps of her mother — retired USF instructor Dolly Gooding — when she decided to pursue engineering as a career. "I didn't understand why, but then I remembered that my mom had a summer job at GE and I thought she made toasters and worked at a plant. She actually worked in defense."

Today, as Sirius XM Radio's vice president and senior director of product development, Williams sees more women in engineering roles. But in her specialty — radio frequency microwave

engineering — men continue to make up the vast majority.

"Often I can have 20 to 25 men in the room and just myself. It's still

them excited about the field. One now studies computer engineering in college and another is moving toward that path, she says.

"So many people don't understand what we do. It's more prominent now because of the technology in people's hands," she says. "But I was never really encouraged in school. I always did really well in math, but if my parents hadn't been involved in engineering, I doubt that I would have pursued it."

"I wish more people, especially girls, understood what a rewarding career this can be if they pursue it. We're making some strides, but we still have a long way to go."

“ I wish more people, especially girls, understood what a rewarding career this can be if they pursue it.

- Wendi Williams

predominantly male," she says. "You'll find more women in digital engineering and software engineering. That's where you're seeing some strides."

Williams has spoken at career days and at other school-related events about being an engineer. She has taken her children and their friends to work with her to get



Hillsborough County Public Utilities Collaboration

The Hillsborough County Public Utilities Department has been collaborating with the College of Engineering on several programs. The Dept. has also provided nearly \$200,000 to the College of Engineering in research support. The implementation of research and instructional projects will remain at the core of the partnerships to support shared research initiatives and projects related to drinking water and wastewater treatment processes.

Collaboration Projects

Project Description	Year	Department	Professor	Budget	Publication
Created and implemented internship program within HC Public Utilities Department (PUD) in 2010 and since then near 80 students have been hired	2010	College of Engineering	N/A	Volunteer Engineering Interns in Public Services	N/A
Falkenburg AWWTP (Phase I) - Modeling Process Control Strategies for Simultaneous Nitrification-Denitrification (SND) in an Oxidation Ditch	2013	Civil & Environmental Engineering	Sarina Ergas	\$27K - Master's Thesis -graduation year: 2014	FWRC 2015 WEFTEC 2015
Phase I - Design and development of a web-based data entry tool for field staff, which will populate the PUD's Asset Mgmt. System	2013	Computer Science and Engineering	Ken Christensen	CAPSTONE project	N/A
Phase II - Design and development of a web-based data entry tool for field staff, which will populate the PUD's Asset Mgmt. System	2014	Computer Science and Engineering	Ken Christensen	CAPSTONE project	N/A
South/Central Hillsborough County Service Area Capital Improvements - Evaluated expansion of Falkenburg AWWTP	2014	Civil & Environmental Engineering	Sarina Ergas	CAPSTONE project	WEFTEC 2014
Hired a graduate student (Larijai Francis)	2014	Civil & Environmental Engineering	N/A	N/A	N/A
Valrico AWWTP (Phase I) - Design of Supervisory Operational System	2014	Chemical and Biomedical Engineering	Aydin Sunol	\$50K - BEST (Bulls Engineering Success Training) Project	TBD
Develop an automated process for the testing of Commercial Backflow devices	2015	Computer Science and Engineering	Ken Christensen	CAPSTONE project	N/A
Valrico AWWTP (Phase II) - Design of Supervisory Operational System	2015	Chemical and Biomedical Engineering	Aydin Sunol	BEST Project - \$50K	TBD
Chlorine Demand and Formation of Disinfection By-Products (DBPs) for Hillsborough County's Water Reclamation Facilities	2015	Civil & Environmental Engineering	Jeff	\$50K - Master's Thesis - Graduation year: 2016	TBD
Falkenburg AWWTP (Phase II) - Modeling Process Control Strategies for Simultaneous Nitrification-Denitrification (SND) in an Oxidation Ditch	2015	Civil & Environmental Engineering	Sarina Ergas	\$21K - Master's Thesis - Graduation year: 2016	TBD

ngineering expo

Engineering EXPO has enthralled school children and adults since 1974 and it is still going strong. For two days every February the public is invited to visit Engineering EXPO on the Tampa campus. The entire event is planned, promoted and run by engineering students. The goal is to educate K-12 students on the importance of science, technology, engineering and math (STEM) in their everyday lives.



As part of the USF Foundation Board's Back to School program, several members participated in Engineering EXPO to get first-hand experience in science and engineering experiments. Board members in attendance were Linda Simmons; T.J. Couch; Gene Engle; Jeff Fishman; Valerie Riddle; Charlie Touchton; and Jose Valiente.



<http://expo.eng.usf.edu/about.html>

Photos: Ryan Wakefield





▲ SOAR Students Compete at NASA Student Rocket Launch Competition

USF students that are part of the Society of Aeronautics and Rocketry (SOAR) earned a unique chance to test their skills at Huntsville’s NASA University Student Launch Initiative in April. SOAR spent eight months designing the Bull-istic II rocket and were selected to compete after submitting their proposal in August 2015. They had the responsibility of designing, constructing, testing, launching and successfully recovering the reusable rocket. Bull-istic II stands upright at 11 feet 8 inches and is constructed from G-12 fiberglass.



▲ Three Teams of Engineering Students Selected to Compete in NASA Micro-G NeXT Challenge

In August 2015, three teams of students from the Bioastronautics class submitted a proposal to NASA’s Micro-G NeXT Challenge. Out of hundreds of applications from U.S. Universities, USF was selected to send three teams to NASA’s Houston Space Center. The teams are tasked with designing, building and testing a tool or device that addressed a current space exploration problem. USF’s College of Engineering was the only Florida school represented in the competition.

The College of Engineering hosts an **Eminent Scholars Lecture Series** each spring on the Tampa campus. This lecture series brings prominent scholars and speakers in their field of expertise from universities across the country to stimulate the students toward thoughtful consideration of matters of great national and international significance.

John R. English, Ph.D., P.E.

Dean, Professor & Irma F. Raymond F. Giffels
Endowed Chair in Engineering
University of Arkansas, Fayetteville
“Qualities of Leadership”



Gary S. May, Ph.D.

Dean and Southern Company Chair
College of Engineering
Georgia Institute of Technology, Atlanta
“Innovation in the Engineering Curriculum through
Active Learning”



Gregory Washington, Ph.D.

Stacey Nicholas Dean of Engineering
Henry Samueli School of Engineering,
University of California, Irvine
“Wearable Electronics: The Next Growth
Engine for the U.S. Economy”



Ranu Jung, Ph.D.

Professor and Interim Dean, and Wallace H. Coulter
Eminent Scholars Chair in Biomedical Engineering,
College of Engineering and Computing,
Florida International University, Miami
“Adaptive Neurotechnology for
Restoring Neural Function”





▲ Lakecia Gunter, 1995 BS Electrical Engineering
 Director of Intel's Partner Marketing and Engagement
 Distinguished Alumni Award



◀ Mark Mondello, 1987 BS
 Mechanical Engineering
 CEO Jabil Circuit, Inc.
 Distinguished Alumni Award



◀ Kishore Bopardikar, 1988 MS
 Computer Science
 CEO and Co-founder of
 Calypso Technology
 Entrepreneurial Award



<http://www.usf.edu/engineering/engineering-excellence/index.aspx>

Photos: Chen Wang | Sweet Lighting Photography

ENGINEERING *Excellence Awards*

Presented by
TECO Energy

The College of Engineering held its annual Engineering Excellence Awards presented by TECO Energy on April 16, 2016 at the Westin Tampa Harbour Island. Six alumni and a prominent faculty member were honored for their significant contributions to the engineering profession as well as the College of Engineering and the University of South Florida.

President Judy Genshaft and Dean Robert H. Bishop hosted the awards. Mark Scheiner, host of University Beat on WUSF, was the emcee.



▲ Award recipients gather on stage, joined by USF President Judy Genshaft and Engineering Dean, Robert H. Bishop.



▲ Devin Walker, 2012 MS Engineering Science
COO Trash 2 Cash Energy
Outstanding Young Alumni Award



▲ John Ramil, 1978 BS Engineering, 2000 Master's Civil Engineering
President and CEO of TECO Energy
Lifetime Achievement Award



▲ William Bracken, 1989 BS, 1994 MS Civil Engineering
President and Founder Bracken Engineering
Outstanding Alumni Award



▲ Dr. James R. Mihelcic
Professor and Samuel L. and Julia M. Flom Endowed Chair in Civil Engineering
Dean's Distinguished Service Award



▲ Dr. Yeh with local children at the NEWgenerator test site in India.

NEWgenerator Could Potentially Provide 2.6 Billion People with Safe Sanitation

By Glenn Cook

A portable, solar-powered sewage treatment device developed by a USF engineering professor could help solve sanitation problems for as many as 2.6 billion people if the product is mass produced.

The NEWgenerator, developed over the past decade at USF by Associate Professor Daniel Yeh and his team of graduate and undergraduate students, is being tested in a community in southern India.

The self-contained device, which uses a bioreactor tank to break down waste into water for irrigation and produces byproducts such as methane gas and nutrients, is designed for developing

nations where current sanitation systems are inadequate or nonexistent.

Yeh says the NEWgenerator — NEW stands for nutrients, energy and water — could fill a “potentially huge need” in those countries. In addition, the methane gas produced by the device can help generate energy, while the nutrients can be used in fertilizer.

Americans give little thought today to flushing their toilets, says Yeh, who teaches civil and environmental engineering. But 40 percent of the world’s population lives in places where adequate sanitation is not currently available.

“We don’t think much about sanitation,” Yeh says. “In the houses we live in, there’s a toilet and we just use it and we don’t think about it. But nearly 40 percent of the world’s population has to think about where they will go to relieve themselves. It’s done in very dirty, smelly conditions.”

Yeh, who started work on the system in 2002 as a postdoctoral researcher at Stanford University, says current conditions in developing countries present “a huge health problem” as well as a “human dignity problem.”

“Safe sanitation is hugely critical, but often neglected because it’s something that people don’t like to talk about,” says Yeh,



◀ From Left: USF engineering students Robert Bair (CEE, PhD), William Sutton (EE, BS) and Jorge Calabria (CEE, PhD) with the NEWgenerator at the test site in India.

who brought the project with him to USF when he started teaching at the university in 2005.

Yeh says the unit uses multiple membranes that filter the wastewater, then chlorine to safeguard against harmful organisms. By further breaking down the elements normally discarded by wastewater systems, the system can recover things such as nitrogen, which in turn can be used in agriculture. Water also can be piped to greenhouses and one side of the NEWgenerator has a series of hydroponic pipes that hold plants that are fed by a steady stream of recycled nutrient water.

In India, the 40-square-foot generator, which can handle the daily waste of up to 100 people, is connected to two self-cleaning bathrooms. These “eToilets,” made by Indian partner Eram Scientific, are relatively new to the waste industry. The entire system is carefully monitored by CEE doctoral student Robert Bair, who is using the field test for the final chapter of his dissertation.

USF potentially will license the technology, but Yeh says he may create a start-up company to produce and market the machine once final testing is complete. His team recently developed a business plan and conducted customer

discovery through USF’s I-Corps Sites entrepreneurial program. In addition to the global sanitation market, potential customer segments also include the military, disaster relief, eco-tourism and others in “off-grid” locations. Thus far, the project has received more than \$350,000 in outside funding for R&D, including \$200,000 from the Indian government, \$100,000 from the Bill and Melinda Gates Foundation, and another \$50,000 after Yeh’s team won the 2014 Cade Museum Prize awarded to inventors and entrepreneurs. Additional support has come from the National Science Foundation and the Florida Energy Systems Consortium, as well as a multitude of industrial sponsors including Pentair (membrane), CMCI (container), Trojan (battery) and WaterStep (disinfection).

“It’s messy business,” he said. “I think we’re sort of in this interesting position that we’re doing something most people wouldn’t want to do, but it’s hugely important for humanity.”



▲ CEE PhD Candidate Robert Bair with the NEWgenerator at field test site in India.



▲ Comparison of NEWgenerator influent (dirty toilet water) and effluent (clean recycled water).

Environmental Engineering Professor James Mihelcic Receives Endowed Chair Appointment

By Janet Gillis



Photo: Ryan Wakefield

Dean Robert H. Bishop announced the appointment of Dr. James Mihelcic, professor of environmental engineering to the Samuel L. and Julia M. Flom Endowed Chair in Civil Engineering.

The Flom Endowed Chair was established in the College of Engineering by Julia Flom in honor of her late husband, Samuel. Mr. Flom held a degree in civil engineering from Lehigh University and founded Florida Steel Products in Tampa.

Dr. Mihelcic has an outstanding record of research and scholarly activity. He is a State of Florida 21st Century World Class Scholar. He directs the Peace Corps Master's International Program and an EPA-funded National Research Center for Reinventing Aging Infrastructure for Nutrient Management.

In addition, he is the lead author of three textbooks: *Fundamentals of Environmental Engineering* (John Wiley & Sons, 1999); *Field Guide in Environmental Engineering for Development Workers: Water, Sanitation, Indoor Air* (ASCE Press, 2009); and *Environmental Engineering: Fundamentals, Sustainability, Design* (John Wiley & Sons, 2010, 2014).

The Department of Civil & Environmental Engineering and the College of Engineering hosted a public reception and seminar on November 13, 2015 in honor of his appointment in the Gibbons Alumni Center (Traditions Hall).



Photo: Ryan Wakefield

Lab Dedication Celebrates Largest In-kind Gift in USF History

By Janet Gillis

Virtual Software Provides Real-World Experience for Engineering Students

The USF College of Engineering celebrated its 20-year partnership with Keysight Technologies, Inc., with a Lab Naming Ceremony on Friday, January 22. The donation of Advanced Design System, or ADS Software, is the largest in-kind donation ever in the history of the University. In honor of the donation, the Center for Wireless and Microwave Information Systems (WAMI) is being renamed the Keysight Technologies Wireless Laboratory.

Thanks to Keysight, students in the Electrical Engineering Department have access to this powerful simulation tool, currently used throughout the RF/microwave and wireless industries and in research labs and universities across the world. ADS software allows students to design and predict the performance of high frequency circuits before they

are built, saving both money and time. “We are so pleased with the incredible generosity of Keysight Technologies,” said Joel Momberg, CEO of the USF Foundation. “This gift means access to software that makes our engineering graduates highly sought after in the workforce.”

The College of Engineering has a long history using the ADS software. Since 1996 – when ADS became one of the first computer-aided engineering programs on the market – the Electrical Engineering Department implemented it. Now, the software is embedded in USF electrical engineering coursework and is installed in all computer labs.

“This long-term commitment by Keysight is a validation of the quality of the engineering program here at USF,”

said Dr. Robert H. Bishop, dean of the College of Engineering. “Armed with this experience, our students are moving quickly into the workplace and creating the next technological advances.”

The WAMI lab was founded 20 years ago with an equipment grant from Keysight and matching funds from the National Science Foundation. Through the years that followed, Keysight – through its in-kind software donations – has been a top donor to USF, with software donations totaling more than \$203 million.

“Keysight is dedicated to meaningful collaboration with researchers and educators around the world,” said Todd Cutler, vice president and general manager of Keysight Technologies.

Gary Smallwood Leads Development Team

By Glenn Cook

Gary Smallwood has spent his career raising money for higher education programs at institutions large and small, and he sees a great deal of potential at University of South Florida, especially in the College of Engineering.

“Everything is here that we need,” says Smallwood, who became the college’s Senior Director of Development last fall. “We just have to go out and start talking about the college one-on-one with people.”

With 19,000 alumni, including 12,000 who continue to live in Florida, Smallwood sees “enormous potential” in garnering support and bringing in resources for the college, which marked its 50th year in 2014-15.

“We have great leadership here now with the dean and executive associate dean, and there’s such an opportunity to get support from our alumni, friends of the college and the corporate community,” Smallwood says. “It’s a market that has largely been untouched in terms of us getting out to see them and making a case.”

Raised in Virginia, Smallwood graduated from Virginia Tech, where he started his career. He then worked at Georgia Tech for 15 years before moving to

California, where he raised money for San Diego State University and Harvey Mudd College. He started at USF on October 26 and spent much of the fall and winter building his staff.

He’s also been doing quite a bit of homework.

“When you become a fundraiser, you are hired for your experience in bringing resources to the university,” Smallwood says. “There’s a learning curve when you go from one school to another. You have to learn about the culture, the people you’re building relationships with, the people you’re raising money from, and the programs you’re supporting.”

The key to raising money, he says, is showing prospective donors the value of their investment.

“The stronger you build the college, the stronger the university becomes and then the stronger their degree becomes,” Smallwood says. “It’s a series of building blocks. People will give because they are interested in seeing the college succeed, and we have to be good stewards of those gifts. We are lucky and fortunate that all of the pieces are in place to do just that.”



Photo: Ryan Wakefield

▲ Gary Smallwood,
Senior Director of Development

Beth Fontes, Director of Development since 2011, has left the college to join Morton Plant Mease Hospital Foundation as Director of Development and Planned Giving in Clearwater.

“ People will give because they are interested in seeing the college succeed, and we have to be good stewards of those gifts.

- Gary Smallwood

Tim Murphy has joined the College as Director of Development. He previously served as Director of Development at his alma mater, James Madison University in Harrisonburg, VA.



Photo: Ryan Wakefield

Introducing Tim S. Murphy

Tim brings over 15 years of financial services and fundraising experience to his role as Director of Development in the College of Engineering at the University of South Florida. By combining professional and personal passions, Tim focuses his work on assisting USF alumni and friends in supporting the university to help fund scholarships, research, faculty support, and facility improvements.

While earning his bachelor's degree in marketing from James Madison University, Tim worked in the Office of Development/Annual Fund, helping increase donations while training and managing other students. Since graduating, he has worked in the financial services industry at Prudential Financial, Allstate Financial, and The Guardian. Tim was honored to represent the American Cancer Society as Director of Estate and Gift Planning and then transitioned to higher education serving as Director of Planned Giving at his alma mater James Madison.

In his free time, Tim has been involved in numerous community activities, including serving as a volunteer for the Richmond Men's Golf Tournament, which raises over \$100,000 annually for the American Cancer Society, and as a member of the Board of Directors for the Patrick Henry YMCA and Hitting Cancer Below the Belt (HCB2.org). Tim and his wife, Holly, are high school sweethearts. If not supporting their kids at gymnastics, baseball, soccer, or swimming, you can find them at the beach. In addition to spending time with his family, Tim enjoys playing golf and pool.

Ramachandran: An Outstanding Alumnus and a Leading Social Entrepreneur



▲ From left: Meena, Kumar and Janani Ramachandran.

Since leaving USF's Industrial and Management Systems Engineering department in 1987 with a master's degree, Kumar Ramachandran has started several successful companies and led the expansion of applied materials into India. Kumar was recently honored as one of its outstanding alumni at the 50th year celebration of USF's College of Engineering.

These days, Ramachandran is working on social improvement in his home country. He's on the board of governors for the Indian Institute of Information Technology (IIIT),

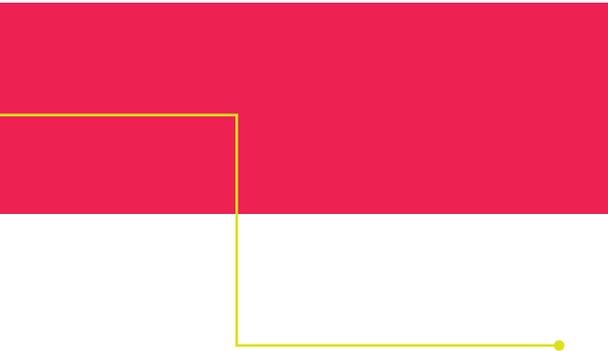
helping make important decisions for the institute. His goal is to bring more applied opportunities to the students, such as internships. He also started a women's entrepreneurial forum to help Indian women coming from rural areas realize they can start companies and develop products.

"I am trying to motivate students," he said. "I ask 'Do you like Uber? Then do something better than Uber.'"

Recently, he launched Gram Suchana Solutions, which is a social entrepreneurship initiative focused on empowering rural India through technology. And while Ramachandran

has lots of experience starting companies in India, the idea for this particular project was inspired by his daughter, Janani, who recently graduated from Stanford University and is passionate about progressive activism.

It was also partly inspired by a fractured toe. That's because Ramachandran, who had injured himself, found himself lying in bed. He had sold his company, Vignani Technologies, in 2011 and was working only part-time with the IIIT. He began contemplating a new project and thought of rural India and the



► From Left: USF President Judy Genshaft, Kumar Ramachandran, and Dean Robert H. Bishop.

Photo: Chen Wang | Sweet Lighting Photography

huge difference between, for example, women in India’s major cities and women in rural areas.

“There’s a huge difference when you look at the urban-rural divide,” he said thoughtfully.

Through Gram Suchana Solutions, Ramachandran is working to help empower farmers and carpet-makers in rural areas and give them the tools — through an online marketplace — to make more money on their product. He also hopes to create a social network for rural India to promote social change.

“My daughter says, ‘Why don’t you call yourself a social engineer?’” he quipped with a smile.

Ramachandran recently visited USF’s College of Engineering for the first time in years. He met other graduates who became entrepreneurs and he thinks that together, they can work with the college on real-world issues, perhaps in Latin America, he mused.

For now, he is based in Bengaluru,

India, which is the center of India’s technology industry. It’s the right place to be, he commented, not only because India is his home country, but also because it is a growing country with huge potential.

“It’s a great place to be, to really build something,” he declared. “From a capitalist angle, it’s a great place to build something, faster and better, and from a social angle, there’s a lot to contribute. Opportunities are plentiful if you want to build a large company, and there’s also a lot of opportunity to do good.”

Endowment for Innovation and Entrepreneurship

When Kumar retired, or at least he thought he did, after selling companies he founded, Vignani Technologies Pvt Ltd. (2005-2014) and Vignani Solutions (2009-2010), he pondered about turning to religion. But it did not take long for him to find in his crosshairs the word ‘education.’ Giving back to his alma mater became his mantra and soon he found himself on the phone

with the College of Engineering at USF.

Kumar and his wife, Meena, decided to make a major gift to the Industrial and Management Systems Engineering Dept. to establish an endowment to promote innovation and entrepreneurship among all industrial engineering students. Endowment supported activities will include design of product and services, prototyping, patenting and licensing, venture formation, seeking venture capital, and attending conferences and competitions.

During a reception honoring their commitment, Kumar said “USF is where I had my first job and I learned to take responsibility and received my first-ever pay check.” He also shared memories of his school days at USF. “It is heartwarming to see how united and committed Meena and Kumar Ramachandran are in their sincere desire to give back,” said Dr. Das, professor and chair, and also a classmate of Kumar.



▲ Fabiola works on a project within the Keysight lab.

This Bolivia Native is Working on Diabetic Testing Innovations

By Glenn Cook

Fabiola Cespedes Araujo started her doctorate program in electrical engineering at USF with the goal of helping people in low-income countries like her native Bolivia. Thanks to a foundation that helps women from developing countries pursue higher education in STEM fields, she's been able to do just that.

Araujo received the prestigious Schlumberger Foundation's Faculty for the Future Fellowship, which covered

the full tuition and fees, as well as travel expenses, health insurance, stipends and research materials for the just-ended 2015-16 school year. The fellowship has allowed her to spend the last year developing an alternative method for continuous blood glucose monitoring to help critically ill patients suffering from diabetes.

"I am researching the feasibility of implanting a bio-compatible glucose sensing antenna in the body and the

alternatives to have this information displayed outside the body," Araujo says. "An implantable solution would not only eliminate the constant finger pricking and weekly needle insertion required by today's continuous glucose monitoring, but would also represent less costs in the long run."

According to the International Diabetes Foundation, many middle- and low-income countries have more people under the age of 60 with

diabetes compared to the world average. In Bolivia, one of the poorest countries in South America, many families can't afford to purchase adequate insulin, and self-monitoring is often impossible. Diabetes-related complications such as kidney failure, retinopathy and cataracts are common even in adolescents.

Araujo says she was motivated by her belief in “the final outcomes of this project.” Previous research showed that silicon carbide — the material used in the implants — is both bio-compatible and hemo-compatible, and she believes her findings can help bring the product to the finish line.

The Schlumberger fellowship is awarded to women from developing countries or emerging economies who are pursuing a PhD or postdoctoral studies in STEM fields. They must also be willing to contribute to the socio-economic development of their home

countries by working as faculty in their home universities, pursuing relevant research, or using their specific expertise to address public policy matters.

Araujo, who plans to return to Bolivia to work as a professor and pursue research on electrical engineered devices in her native country, says her USF experience has been everything she imagined and more. She credits her advisor, Professor Stephen Sadow, with playing a key role in her “academic learning journey.”

“I was attracted to USF because of its high-tech and multi-disciplinary research programs,” she says. “My experience has been amazing, particularly in the silicon carbide (SiC) group. I’ve gained wide experience and made academic connections. It has been great.”

Photo: Courtesy of Grad Images



At Commencement on May 7, College of Engineering students proudly show the steel rings they acquired at the Induction into the Profession Ceremony the College held the night before. At the Spring 2016 ceremony, 628 engineering students were awarded degrees – 26 doctorates; 178 master's; 424 bachelor's.

The Growing Field of IT Now Offers an Online Bachelor's Degree

By Glenn Cook

As nontraditional students interested in pursuing careers in the information technology field continues to rise, USF's Department of Computer Science and

USF can take online classes starting in their junior year. After receiving a bachelor of science in Information Technology (BSIT), they can continue to pursue a master's degree (MSIT) online.

"We've had an influx of new students who go through their freshman and sophomore years and then get a job or internship in their chosen field when they reach their junior year," says Ken Christensen. "The flexibility of online courses is a big benefit to them."

Christensen says the Information Technology program, which focuses on identifying suitable technologies and applying fundamental computing knowledge to solve business problems, fills the gap between Computer Science and Management Information Systems.

"Many of the students who come into the IT program transfer from community colleges and are first-time students at USF," Christensen says. "The IT program continues to be a successful online program."

According to the U.S. Bureau of Labor Statistics, employment in the IT field is expected to grow at almost twice the pace of professional, scientific and technical services between 2010 and 2020. The traditional IT field is changing due to huge growth in cloud computing services that are delivered over the Internet, and there is growing demand for the types of specialization

offered in the USF program.

"The IT program is not calculus based like our computer science and computer engineering programs are," Christensen says. "It is also not oriented toward teaching to certain certification tests, but more on building up students' background knowledge to take certification tests on their own. There are opportunities to get more job ready skills more quickly in this program."

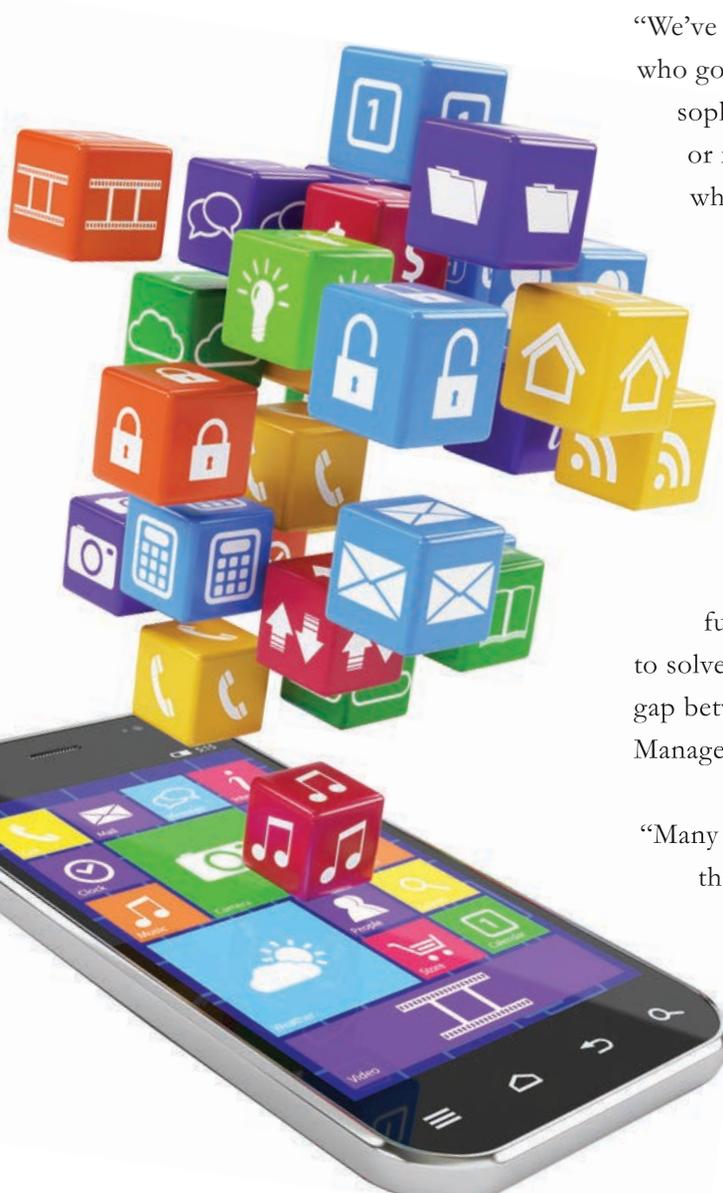
“ There are opportunities to get more job ready skills more quickly in this program.

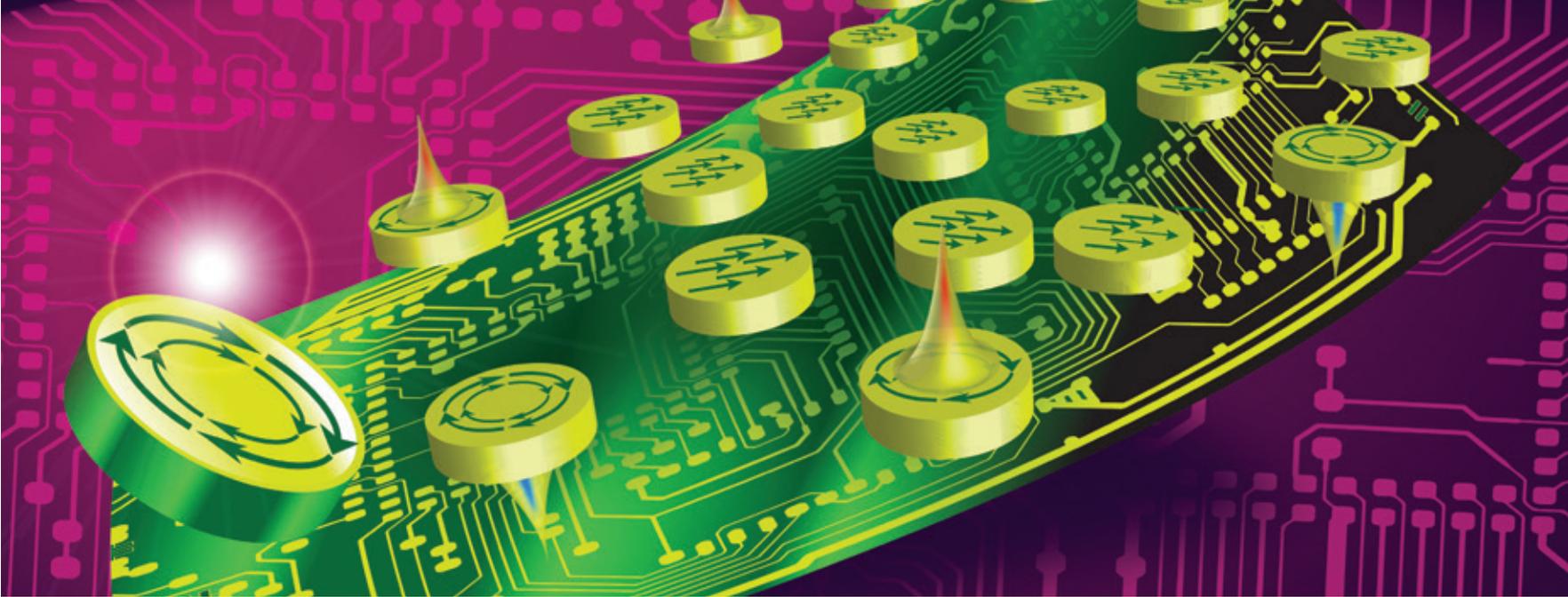
- Ken Christensen

There also are more opportunities for USF to work with prospective employers and recruiters who are anxious to get qualified candidates to fill their IT needs. One such employer is the City of St. Petersburg. Sharon Welch, a systems development manager for the city, hired USF student Brandon Do to work in her department. Welch is supervising Do as he works on his bachelor's degree, and has made several trips to USF to work with other students interested in Information Technology careers. "Sharon has been great because she's able to talk about what it's like to live in today's IT environment, the challenges and the changes that the industry is facing," Christensen says. "These are actual jobs we're preparing students for, and having employers come in and take more of an active role in their education will only help everyone."

Engineering offers opportunities to receive bachelor's and master's degrees in the field through online coursework.

Students interested in pursuing an Information Technology degree from





USF Researchers Unleash New Way of Computing Using Nanomagnets

By Glenn Cook

As more and more demands are placed on the technology we use daily, USF College of Engineering researchers are looking for alternative computing methods that can speed up the processors without using additional power.

The most promising is in the field of nanomagnetism, sub-100 millimeter magnetic structures that can be used to solve complex problems in fewer clock cycles than traditional processors. Five authors from the Departments of Electrical Engineering and Computer Science and Engineering recently published their findings in the *Nature Nanotechnology* journal.

“Everyone is trying to explore what will happen beyond the current computing technology that is available,” says Sanjukta Bhanja, associate professor in the Department of Electrical Engineering, and lead author of the journal article. “We’re looking at and exploring different alternatives, including how the brain works and

how nature works, so that we can find ways to develop powerful high-speed computing.”

According to Bhanja, the research team tried to see if nanomagnetic systems could be used for optimization and whether it could be done in a time-efficient and cost-effective way. Optimization is the process of finding the best solution from all feasible solutions. The team used the systems to “solve the quadratic optimization problems that arise in computer vision applications.”

This technique finds salient features in an image with 85 percent of true positive, Bhanja says. Most importantly, since magnets are working in parallel, the magnetic computing, on average, is many orders of magnitude faster than current industry-standard optimizers like IBM ILOG CPLEX. This shows the potential to “develop a magnetic coprocessor that might solve complex problems in fewer clock cycles than traditional processors.” “These optimization problems take a

long time in computational theory and it’s expensive. Even if you have many-core processors, it doesn’t perform well,” Bhanja says. “So we’re trying to see how nature does, using magnets, to solve a very difficult problem in a nanosecond.” Bhanja says the results indicate the magnets can be used for “large groups of problems—such as finding patterns in social media, error-correcting codes to Big Data and biosciences, at rapid speeds,” she says.

Bhanja’s collaborator is Sudeep Sarkar, computer science and engineering professor and an expert in computer vision. Bhanja’s students Javier Pulecio (now at NIST) and Anita Kumari (now a faculty LPU, India) had provided some important prior-art to this theme of computing. Contributing authors of the *Nature Nanotechnology* paper were students D. K. Karunaratne (now at Intel Corporation), Ravi Panchumarthy (now at Intel Corporation) and Srinath Rajaram (now at Micron Technology Inc.).

John Ramil Looks Back on a Lifetime at TECO and USF

By Glenn Cook

John Ramil's career, family and legacy are forever linked to the Tampa community, the University of South Florida and the College of Engineering.

Ramil, a Tampa native, was a USF engineering student when he started as an intern at TECO Energy in the mid 1970s. He rose through the ranks and became the president and CEO of one of the region's top employers in 2010. After earning his master's degree in civil engineering from USF, he was appointed in 2001 to the USF Board of Trustees, where he has helped lead the university during a period of tremendous growth and expansion.

For his efforts, Ramil was honored with a Lifetime Achievement Award at the Engineering Excellence Awards dinner in April. The highest honor bestowed by the college, the award recognizes an individual who has brought distinction to USF by their contributions to society.

"I was really very surprised when the dean called and said I had received the award," Ramil says. "It really was quite an honor to be recognized in that way because the university is such a part of my family and this community. I'm really quite humbled by it all."

Given the career opportunities that TECO Energy has presented, it might surprise some to learn that Ramil wasn't sure what he wanted to do after high school. But his teachers and counselors nudged him toward engineering and USF, which then was starting the second decade of its program. "I was good in math and good in science and interested in both," says Ramil, who graduated from Tampa Catholic High School. "So I started in the civil engineering program, specializing in the environmental area, looking at wastewater treatment and drainage."



Photo: Courtesy of Grad Images

▲ John Ramil is hooded at the May 2016 Commencement Ceremony as he receives an honorary doctorate from USF.

At the start of his junior year at USF, Ramil's academic advisors urged him to pursue a cooperative education program that would allow him to go to school for one quarter and work for the second at a company. TECO proved to be a natural fit, and he started as an intern at the utility in March 1976.

"My advisors gave me some good advice, because they wanted me to see that engineering was a broad field with so many different types of opportunities," says Ramil, who worked on several assignments at TECO power plants over four quarters and two years. "When I graduated with a bachelor's degree, I went to work full time in the environmental department and haven't looked back since."

Ramil says he was fortunate to receive opportunities for advancement within TECO. Over the years, he worked in the engineering, systems planning, fuels, and customer service departments. He became manager of the utility's environmental department at age 26.



“At that point, I got more involved in the managerial work than the engineering work,” he says. “I became more involved in the business activities and the decision making of the company. I moved up, became a director and ultimately vice president and worked in a lot of different areas.”

In 1997, Ramil was named chief financial officer, which allowed him to use his formal education in engineering and the business training he had received at TECO to lead the financial side of the business. The following year, he was promoted to president of TECO's electric company division. It was during this time that he decided to return to USF for his master's degree in civil engineering, which he received in 2000.

“I started on it a little bit at night after I finished my undergraduate, but my wife and I had a family and kids, and we both had full-time jobs,” he says. “My job and my family were my priorities, but by the late 1990s I knew I needed to get back after it. Encouraged by my wife and friends, I knew the advanced degree was something I wanted to pursue.”

It didn't hurt, Ramil says, that he has a “USF family.” His wife, Naida, received her education degree from USF, and daughter Jennifer earned her bachelor's and MBA from the university.

“Since Naida and I got out of high school we've had an association with USF, educating ourselves and our family and trying when we can to give something back,” he says.

Ramil served on the advisory board for the College of Engineering for several years. As his TECO career progressed, he became more involved with the university as a whole, serving on the foundation and alumni boards. When the state restructured the university system in 2001, he was appointed to become part of USF's first Board of Trustees. “It's been an incredible time to be associated with the leadership of the university,” says Ramil, who credits USF President Judy Genshaft for her work over the past 15 years. “When you look at our academic standards, the average SAT scores of our students, you can see what a dynamic place this has become. It's especially incredible when you compare us to other universities with similar rankings. Most of them had a 100-year head start. They started in the 1850s, not the 1950s like USF.”

Ramil says he is proudest of USF's growth and standing as a major research university.

“One of my fondest memories was very early in 2001-02 when the first group of trustees was working on strategic planning for USF, and we set out to be a top 50 research university,” he says. “People who were watching us may have chuckled a little bit, thinking that we were trying to turn a regional commuter school into a major research university, but it happened. It has happened.”

TECO's proximity to USF has made the university a natural feeder program for employees. Currently, 300 of the 2,000 TECO employees in the Tampa Bay area are USF graduates. Of those, 80 are from the College of Engineering.

“An entity like USF is perfect for our business, because we are very education oriented,” Ramil says. “Corporations have a responsibility to support the areas in which they operate, particularly in a business like ours, a utility business, where the whole community is the customer.” Ramil points to studies that show USF's economic impact is more than \$3.5 billion a year on the local economy as another reason that TECO is so heavily involved with the university.

“When you look at a business like ours, your growth is driven

by the growth of the economy in the area. Given that USF is such a driver in our local economy, it makes good sense for us to be closely aligned with the university in our philanthropic activity and in other ways that we can be involved.”

Ramil, who was named CEO of TECO Energy in 2010, says he can’t believe how “fast the time has flown.” Now 60, he is starting his fifth decade with the company that has “given me so much.”

“It really has moved so quickly,” he says. “I never had a goal to spend my life here in the Tampa area and stay with the company, but I’ve always enjoyed what I’ve done. One day you wake up, you’re turning 60 and you have 40 years in, and you wonder where the time has gone.”

More changes are coming to TECO. The utility entered into a merger agreement last September with Emera, a Canadian-based energy company. Ramil says the merger, which should be finalized by this fall, is not expected to impact TECO’s employees or the community.

“They have no operations that are anywhere near any of ours, and the plans are to keep all of the people and leave things intact,” he says. “It will be a good story for the employees and the community.”

Once the merger is complete and the utilities are under one owner, Ramil is not sure what his future role will look like. He knows he wants to spend more time with his family. Wife Naida is retired, daughter Jennifer is a stay-at-home mother with two children, and son Chris has a truck customization shop in the Tampa area.

“I’m now 60 years old and I’ve had a great career,” he says. “I’ll make sure the transaction closes, the transition is seamless and everything goes well. Whatever they want me to do to make that happen is what I’m happy to do. I know I’ve been blessed every step along the way.”

Capturing Carbon Dioxide

By Glenn Cook

Roland T. Okwen has traveled a long way to get to where he is, on the precipice of a program that could help lessen the impacts of climate change through the permanent underground storage of greenhouse gas.

Okwen, who earned his PhD in civil engineering from USF in 2009, now is a reservoir engineer at the Illinois State Geological Survey/University of Illinois at Urbana-Champaign. He has received almost \$3 million in grants from the U.S. Department of Energy to identify ways to capture and store carbon dioxide (CO₂) and is pursuing an additional \$38 million in funding

for the second phase of his promising research.

“The reason we’re doing this is to develop technology to reduce CO₂ emissions to the atmosphere,” Okwen says.

“**The reason we’re doing this is to develop technology to reduce CO₂ emissions to the atmosphere.**

- Roland T. Okwen

“Increases in CO₂ or greenhouse gas emissions warms the climate as it accumulates leading to changes in the atmosphere, on land and in the oceans, which have positive and negative effects to the society and the environment. However, the negative effects could be drastic.”

Okwen, a native of Cameroon in Central Africa, started looking for ways to capture and store CO₂ more than a decade ago, while working on his master’s degree at the University of Denmark. He then continued to pursue his research while working on his PhD at USF, where he received the Alfred P. Sloan Minority Scholarship.

Okwen noted that Professor Jeffrey Cunningham (his PhD advisor) and Diversity Program Director Bernard Batson were his mentors at the university. “They assisted in providing social support, networking opportunities with researchers and students, and funding to pursue my research. The work was tremendously challenging, but the support was always there.”

At the time, Okwen says, USF was the only university that was actively conducting research in CO2 sequestration in the state of Florida. “It was unique,” he says. “For some time, I was the only person who knew how to use the software for simulating CO2 storage at USF.”

The Sloan scholarship also was key to Okwen’s success in his program.

“What I appreciated was the flexibility that it offered,” he says of the scholarship. “I was able to keep it throughout the entire program, and anytime I found a conference or training that I thought could be instrumental in my professional development or my research, I could tap into that resource.”

After Okwen graduated from USF, where he served as a student representative on the Graduate Council for three years, he received a 12-month, European Union post-doctoral scholarship to work as a research associate at Schlumberger Cambridge

Research Center in England. He then returned to USF as a consultant for three months to work on a project involving carbon dioxide and municipal wastewater disposal.

At the Illinois State Geological Survey, Okwen and his team have been researching strategies of making carbon capture and storage technologies commercially viable and deployable.

Alumni News

Marcia L. Alvarado, PE, senior structural engineering for Atkins Global, was part of the Building Design + Construction 40 Under 40 Class of 2015. Marcia graduated in 2009 after earning a master in civil engineering degree. <http://www.bdcnetwork.com/meet-bdc-40-under-40-class-2015>



Retired U.S. Air Force Colonel **Calvin Williams**, 1984 industrial engineering graduate, was appointed USF’s new vice president of administrative services in August 2015.

Jonathan “J.B.” Wright, has a new job as manufacturing engineering manager at Lockheed Martin. Jonathan received a BS in industrial engineering in 2005.



Andrew Rohling, 1989 BS in engineering, was recently promoted to Brigadier General in the U.S. Army.

Lakshmi Pinnamaneni, 2015 MS in computer science, an internationally recognized chess player, recently achieved the Women International Master title FIDE.

Student News

Chemical & Biomedical Engineering

Surya Cheemalapati received a 2015 Signature Research Fellowship from the USF Office of Graduate Studies.

Josh Borhorquez received the MOAA Cape Canaveral Chapter scholarship.

Anna Hayes received the Chassis Plans Leadership in Engineering Award.

Civil & Environmental Engineering

Michael Esteban received a Frost Scholarship to study at the University of Oxford.

Ileana Wald received a National Science Foundation Graduate Research Fellowship.

Joel Cooper received the NSF East Asia Pacific Summer Institutes Fellowship and the NSF Graduate Research Opportunities Worldwide award.

Erin Morrison received the 2015 Trent R Dames and William W. Moore Fellowships from ASCE.

Suzanne Boxman received the US-Israel BARD Fund Post-Doctoral Fellowship.

Trang Luong received the USF Outstanding Graduate Award at 2015 Summer Commencement.

Emma Lopez placed first at the Tampa Bay STEM Summit.

Computer Science & Engineering

Jesse Brizzi received a National Science Foundation Graduate Research Fellowship.

Gerardo Sanchez named a HENAAC Scholar

Shamaria Engram received a National GEM Consortium PhD Fellowship.

Electrical Engineering

Brian Wright received a National Science Foundation Graduate Research Fellowship.

Juan De Dios Castro received the 2015 Love of Learning travel grant from the Honor Society of Phi Kappa Phi. He also received the MRR-S Graduate Fellowship for 2016.

William Serrano-Garcia participated in the Space Scholars Program at New Mexico's Air Force Research Laboratory.

Michael Grady received Best Student Research Poster Award at IEEE MZTT-S Wireless and Microwave Technology Conference.

Mechanical Engineering

Francesca Moloney received the Mickey Leland Energy Fellowship and also received a National Science Foundation Graduate Research Fellowship.