

2015-2017 PERFORMANCE REVIEW

# ENGINEERING & COMPUTING





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Dear Colleagues and Friends,

In 2015, when Florida International University launched its strategic blueprint, *FIUBeyondPossible2020*, the College of Engineering & Computing took on the challenge to be a driving force for innovation as we build towards the future.

For our College, the period between 2015 and 2017 has been defined by a growing wheel of impact in all strategic areas of emphasis. We have many reasons to celebrate: the success of our students, new discoveries, innovative solutions, enhanced engagement with our local and international communities, and the generous philanthropy of our alumni.



This report is a testament to the commitment of our students, advisors, staff, faculty and alumni to create a diverse, inclusive community that offers opportunity and joy of living to all. I congratulate all who have contributed to the success of our college and look forward to continued excellence and impact.

**Ranu Jung, Ph.D.,  
Interim Dean**  
*Wallace H. Coulter Eminent Scholar Chair  
in Biomedical Engineering*

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*Vice President of Business  
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United Technologies Corporation*



Partners in Collaboration

Multi-University & Industry  
PARTNERSHIPS

The College of Engineering & Computing (CEC) established multi-university partnerships using the 3M approach – multi-university, multi-investigator and multi-million.

Highlights include:

- NSF S-STEM grant awarded to Florida Consortium of Metropolitan Universities – Florida International University, University of Central Florida and the University of South Florida
- NSF awarded a collaborative research grant, the Florida-IT-Pathways to Success (Flit-Path), to the three metropolitan institutions – Florida International University (FIU), University of Central Florida (UCF) and University of South Florida (USF).

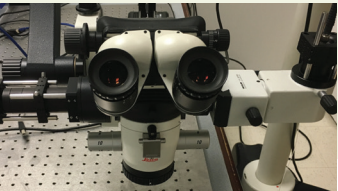
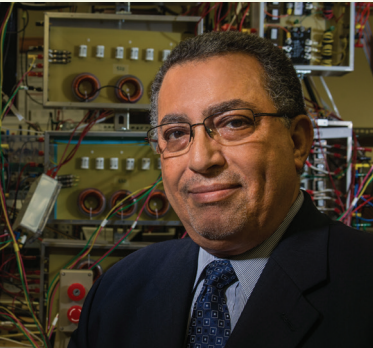
Advanced Materials Engineering  
Research Institute (AMERI)

AMERI is working to create the next generation of advanced materials. The Institute supports materials research and engineering over a broad range of technology and capabilities. AMERI provides analytical instrumentation, materials characterization and micro/nano process and device development laboratories to support faculty and industry in the development and characterization of new materials over the continuum from the nanoscale to bulk materials.

Director Arvind Agarwal, along with the AMERI team, has established several industry and academic partnerships that have recently led to approximately \$900,000 in research awards.

PROTECTING THE NATION'S POWER GRID  
from hackers

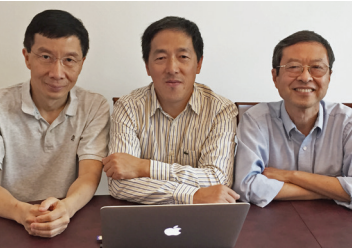
Osama Mohammed, a professor in the Electrical and Computer Engineering Department, has teamed with four other universities and a utility company to reduce the vulnerability of the nation's power grid. Mohammed, who heads the FIU Energy Systems Research Laboratory Smart Grid Testbed, along with his research team are looking at how the modern smart grid would involve deep integration between communications, artificial intelligence, and physical power system hardware in addition to cyber defense measures. The team's research focuses on the co-design of security solutions integrated into all power system layers and incorporates cyber and physical features for attack detection and the creation of defense protocols.



Tool to identify brain tumors in children

Wei-Chiang Lin of the Department of Biomedical Engineering is working with Nicklaus Children's Hospital (NCH) to test an optical device, developed by his research team, to identify brain tumors intraoperatively. With this device, surgeons receive instantaneous feedback regarding tissue characteristics – whether it's malignant or normal – during brain tumor surgery. This allows surgeons to achieve a more complete brain tumor resection, which is important for pediatric brain tumor patients who usually are not good candidates

for follow-up radiation or chemotherapy for their brain tumors. The device may also help prevent unnecessary loss of healthy brain tissue. Over the past two years, Lin's team has integrated this diagnostic tool into a surgical microscope to make it more user-friendly for surgeons. Lin is also working with physicians from the Division of Critical Care Medicine and Pediatric Intensive Care Unit (PICU) at NCH on the development of new diagnostic indices that can improve the management of patients in the PICU.



Early diagnosis and treatment of EYE DISEASES

Shuliang Jiao from the Department of Biomedical Engineering has a long-term collaboration with Rong Wen and Byron Lam, experts in cell biology and ophthalmology at Bascom Palmer Eye Institute. The collaborators are developing innovative and advanced imaging technologies for the early diagnosis of retinal diseases and researching regenerative therapies to cure the major blinding diseases. They have over three patent applications and invention disclosures through FIU. They have submitted three major research grant applications through FIU, one of which was awarded a total of \$2 million by NIH. This NIH award is to fund the development of a highly innovative retinal imaging technology, which could help clinicians diagnose and assess the extent of vision loss in patients with a wide range of conditions.

FIU Partnerships

CEC engaged with various university partners, including:

- **Honors College** – Launched new initiative in an honors to doctoral pipeline, and increased participation of CEC students in Honors College
- **College of Communication, Architecture + The Arts** – Collaborated on I-CAVE project
- **Applied Research Center** – Teamed to support cybersecurity partnerships
- **STEM Institute** – Multiple CEC faculty became members of the institute

NSF Engineering Research Centers  
(ERC) – Site Visits

CEC electrical and computer engineering has been a partner on the ASSIST ERC led by North Carolina State University and hosted the 5th annual NSF site visit at FIU. For a new competition in 2016, CEC partnered with 13 universities, and from 170 pre-proposals, 17 full proposals were invited by NSF, and only eight were selected for final site visits. CEC participated in three of the final National Science Foundation ERC site visits in multi-university partnerships.

Each partnership brings together public and private universities and engagement with many industries. All three center proposals include multiple faculty from biomedical and materials engineering. The results will be declared in summer 2017.



When ART and ENGINEERING collide

Lesley A. Northup, the dean of the Honors College, and Ranu Jung, interim dean of the College of Engineering & Computing, inaugurated the 2016 NestGen art exhibit at the Engineering Center. In aspiring to foster creativity and multidisciplinary problem-solving, science and art merged. This collaboration was inspired by a vision to bring culture and innovative discussion to the engineering campus, and has been followed by a 2017 six-month painting and drawing art installation called *Singularities*.

Engineering Deans Institute  
– FIU Visit

The 2017 annual Engineering Deans Institute, with over 250 attendees from across the nation as well as Latin and South America, was held in Coral Gables, Florida. The theme of this year's conference was "Building the Future: People, Spaces, and Beyond." Interim Dean Jung, was the chair of the planning committee. On opening day, several deans toured the college's Wall of Wind, participated in a panel on "Logistics and Infrastructure Engineering" and attended a Latin-themed reception with a welcome by Provost Furton. President Rosenberg spoke at the conference.

International Partnerships

Going GLOBAL

CEC has enhanced its international partnerships through a new, college-wide agreement with Shanghai University of Engineering Science in China. There has been renewed and increased engagement with other universities in China, Colombia, Germany, India and Thailand to improve student recruitment for dual-degree and M.S. student intake, doctoral students and postdoctoral fellows. Individual faculty research partnerships with Brazil, China, France, India, Japan, Turkey and Australia, among others, have been enhanced, and there has been an increase in international postdoctoral fellows supported by their individual governments.

Inspiring students to pursue  
BIOMEDICAL ENGINEERING

CEC participated in the 5th Annual Herbert and Nicole Wertheim Community Healthcare Conference: "How to Become a Health Professional," also known as the Wertheim Conference. The event offers children in grades K-12 the opportunity to learn first-hand the role of different health professions. Associate Professor Jessica Ramella-Roman spoke to the students about pursuing careers in biomedical engineering, and the CEC sponsored live streaming of the event to Haiti.





A new model for

# INDUSTRY ENGAGEMENT

As CEC continues to foster relationships with local companies, the goal is to emulate successful strategies on a national scale.



1.4 megawatt solar array located at the Engineering Center



Associate Professor Arif Sarwat; FIU President Mark B. Rosenberg; FPL President and CEO Eric E. Silagy; FPL VP, Distribution Operations Bryan Olnick; and CEC Interim Dean Ranu Jung

### Florida Power & Light Company (FPL)

For more than three decades, FPL and FIU have partnered on various initiatives. The recently unveiled 1.4 megawatt solar array allows engineering faculty and students from the Energy, Power & Sustainability (EPS) program at FIU to use the installation to conduct important research that will help FPL advance solar energy in the state.

Through a five-year research grant, faculty and students are analyzing data from the on-site solar panels to understand the impact of intermittent solar power on the electric grid in South Florida’s tropical climate. The researchers also look at historic weather patterns and develop predictive models to forecast the reliability of solar power generation. In addition to hundreds of FPL employees who are FIU alumni, the energy company runs an on-campus customer care training center where students answer calls from customers.

FPL also donated an electric vehicle from its clean fleet to FIU’s College of Engineering to further research and test wireless charging technology. Besides conducting research on wireless charging, the EPS students also work at the FPL laboratories every week to conduct high-end experiments and research on batteries and access points.

### Ultimate Software

**Ultimate Software (Nasdaq: ULTI)**, a leading provider of human capital management (HCM) solutions in the cloud, and FIU announced a 10-year extension to their current technology-education partnership. The new commitment has helped establish an endowment for CEC’s School of Computing and Information Sciences (SCIS), fund scholarships for students at the university, and support the development of science, technology, engineering and mathematics (STEM) education throughout high schools in the community. Ultimate Software first partnered with FIU in 2007 to create the TechSTARS internship program. Through TechSTARS, Ultimate Software works in tandem with the SCIS to identify promising students and to provide them with real-life experience as part of a growing tech company. Since the program’s inception, Ultimate Software has employed more than 100 TechSTARS from FIU as full-time engineers. Sitharama Iyengar, SCIS director, has been instrumental in building various industry partnerships like this one with Ultimate Software.



Ultimate Software guests at the 2015 Tech Station inauguration, left to right: Adam Rogers CTO, Greg Miller Director of Engineering Talent, and Alton Gaines, University Relations Manager



Elizabeth Krear – Sr. Manager - Model Responsible, Ram 1500, Julia Hawley – Sr. Manager - NAFTA Program Manager, Samantha Montesinos –Release Engineer, Body Exterior Fascia/Grille



Students work on their Design Challenge projects



Students maximize materials to build their cars



Winners of the Design Challenge

### Fiat Chrysler Automobiles (FCA US)

FCA US visited CEC and hosted a design challenge with the end goal of hiring FIU students. The event was part of the Women of CEC, an initiative launched by the college to recruit, retain and graduate women engineers. The day began with a panel discussion, *Footsteps: From Campus to Corporate*, which featured several FCA US women executives. The event was moderated by FIU alumna Maria Quintero, ’13, who now works for the company as a foundation brakes engineer. After the panel, students crowded the Panther Pit for the Design Challenge. Participants had to build a gliding car, one with wheels, but that could also fly once rolled off a table. Students were given a budget and had to decide what materials to purchase and then use those materials to create the car. They were judged on design innovation, weight of the car, cost and the distance the vehicle traveled. While on campus, FCA US also presented the FIU’s Society of Automotive Engineers (SAE) Club with an \$11,000 check to help with costs to take the Formula One SAE car to the SAE International Competition held in Michigan in May.



# PREEMINENT PROGRAMS

A Preeminent Program at FIU is a collaborative endeavor that demonstrates extraordinary success in providing unique learning opportunities, pioneering research and engagement while expanding the university’s financial base. Additionally, these programs advance the BeyondPossible2020 strategic plan, and enhance FIU’s reputation at the national and international level.



Atorod Azizinamini, director, ABC-UTC  
Chair, Civil and Environmental Engineering Department

## Accelerated Bridge Construction

University Transportation Center (ABC-UTC)

The mission of the ABC-UTC is to reduce the societal costs of bridge construction by reducing the duration of work zones, focusing special attention on preservation, service life, construction costs, education of the profession and development of a next-generation workforce fully equipped with ABC knowledge. ABC-UTC focuses on three key areas: research, education and workforce development, and technology transfer. In December 2016, the U.S. Department of Transportation awarded the ABC-UTC its second round of funding, allowing it to expand its capacity to provide solutions to the transportation industry’s needs at the national level, with the inclusion of two additional partner universities: University of Washington (UW) and Oklahoma University (OU) joining existing partners University of Nevada, Reno (UNR) and Iowa State University (ISU).

## Wall of WIND (WOW)

FIU’s 12-fan Wall of Wind (WOW) was designated in 2015 as one of seven national multi-user large facilities in the country under the Natural Hazards Engineering Research Infrastructure (NHERI) program, and one of only two nationwide dedicated to studying extreme wind events. The WOW is the largest and most powerful university research facility of its kind, capable of simulating Category 4 hurricane winds. National Science Foundation-funded researchers use the “experimental facility” to work on wind engineering projects, and are part of a network of scientists who study various aspects of natural hazards.



## Pioneering device may restore sensation to amputees

The FDA has granted an investigational device exemption for the first-in-human trial for a neural-enabled prosthetic hand system (NEPH) developed by Ranu Jung, and her Adaptive Neural Systems Laboratory team. Jung’s technology stimulates nerves in the arm to provide sensation as the person is using the prosthetic hand. The prosthetic system has the first fully implantable, wirelessly controlled Class-III device with electrodes that can be surgically implanted within the nerves of the residual arm. Similar to a pacemaker, the system works by delivering small electrical pulses to specific nerves in the arm. Wires as thin as a hair strand are placed within nerve bundles in the arm and connected to an electrical stimulator. Sensors embedded in the prosthetic hand send signals wirelessly to the implanted stimulator, which then elicits sensation by delivering weak electrical pulses via the implanted electrodes. As a result, the person should be able to sense their hand opening position and grip items when the prosthetic hand encounters an object.





# EXTERNAL PROGRAMS

Serving the needs of a growing and diverse student body



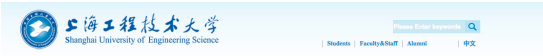
### Master of Science in Logistics Engineering

The College of Engineering & Computing offers the only graduate degree in logistics engineering in South Florida. The new master's program, which admitted its first students in the spring of 2017, prepares individuals for careers as logistics systems engineers, supply network analysts, logistics planners and operation managers.

The program provides training and research support for an active local logistics industry. As a gateway to Latin America, the Caribbean and Europe, South Florida supports two international airports, two cargo ports, major cruise lines and numerous freight transport companies. The program will graduate professionals ready to enter waiting jobs and feed the state of Florida's aspirations of growing its status as a global hub for trade, logistics and export-oriented manufacturing activities. With more than half a million Floridians already employed in logistics and distribution, the need to expand the workforce remains great.

### International Student Degrees

The College of Engineering & Computing recently entered into two international academic agreements. FIU leaders, including FIU Provost and Executive Vice President Kenneth G. Furton, Vice Provost for Faculty and Global Affairs Meredith A. Newman and CEC Interim Dean Ranu Jung, traveled to China to sign two academic agreements with the Shanghai University of Engineering Science. One was a graduate pipeline agreement, and the other was an undergraduate dual-degree agreement in electrical engineering. Another graduate pipeline agreement was signed in China with Hebei University. The college already has an undergraduate dual-degree agreement with them. CEC will also be offering the master of science in engineering management program at the University of Commonwealth (UCC) in Kingston, Jamaica starting in Spring 2018. The 13-month program will be taught at the UCC facilities.



The college also signed a renewal of its civil engineering dual-degree agreement with the Universidad Iberoamericana in Santo Domingo, Dominican Republic. The program offers undergraduate students in the DR the opportunity to complete two degree programs concurrently. Students divide their studies between Miami and Santo Domingo to meet graduation requirements that will earn them diplomas from both institutions. Participants have the opportunity to learn from a diverse faculty and gain a broader understanding through exposure to a variety of perspectives and experiences.

## Phi•lan•thro•py

fə'lanTHrəpē/

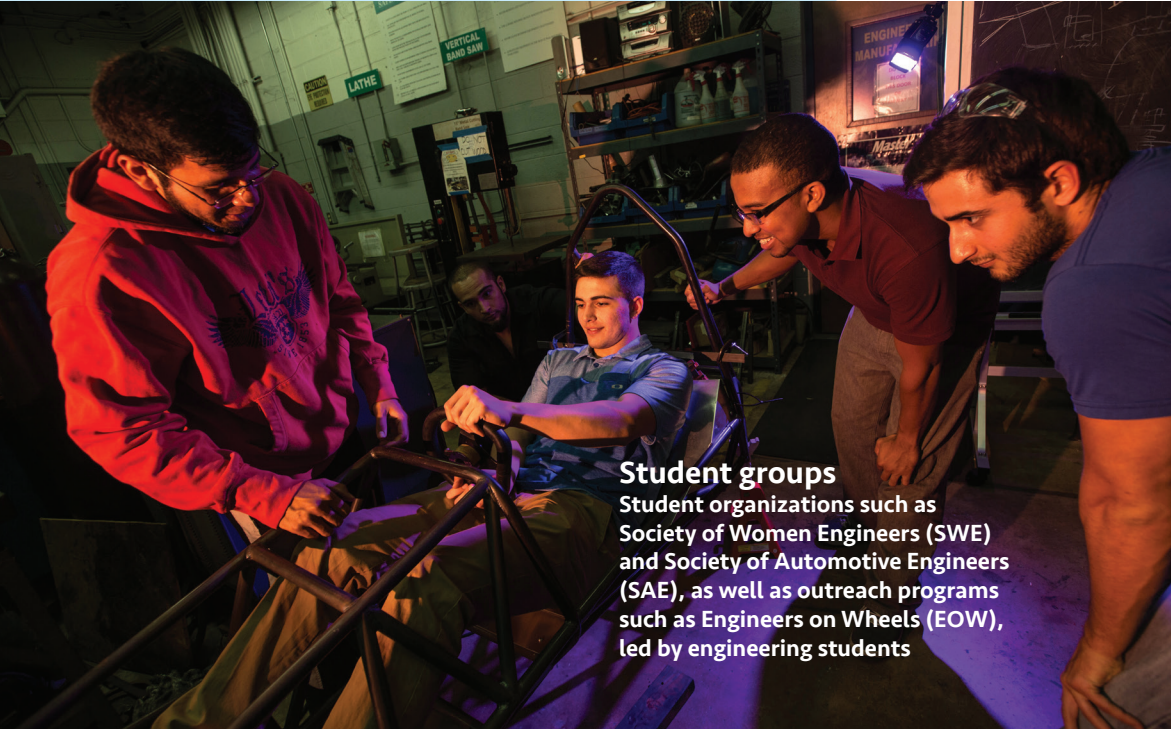
Private gifts in 2016-2017 exceeded

# \$11.3 M

in support of the college's mission,  
helping to fund programs such as:



**First-generation scholarship endowment**  
Scholarships awarded to students who are the first in their immediate family to earn a baccalaureate degree



**Student groups**  
Student organizations such as Society of Women Engineers (SWE) and Society of Automotive Engineers (SAE), as well as outreach programs such as Engineers on Wheels (EOW), led by engineering students



**Engineering Expo**  
Annual event that welcomes more than 1,500 K-12 students to the college and exposes them to hands-on activities to spark an interest in engineering careers



# Alumnus GIVES BACK



Chad Moss, left, and President Mark B. Rosenberg at the 16<sup>th</sup> Annual Torch Awards Gala

## **Chad Moss** *Executive vice president, Moss & Associates*

Chad Moss made a \$10 million gift to FIU's College of Engineering & Computing – the largest donation by an alumnus to date.

"Chad Moss has shown incredible vision and entrepreneurship in Miami and across the country," said FIU President Mark B. Rosenberg. "This generous and history-making donation will help us educate a new generation of construction professionals who will have an impact on our community and beyond."

In recognition of his gift, FIU's College of Engineering & Computing will name the school as the Moss School of Construction, Infrastructure and Sustainability. With more than half of the world's population living in urban environments, the school's naming coincides with the academic reorganization of the school, reflecting a broader view of the industry and new approaches and methods for building sustainable urban infrastructure.

"I believe in the power of giving," said Moss, who graduated from FIU in 1994 with a bachelor's degree in construction management. "I hope this gift leads to generations of students who are curious, passionate about learning, and equipped to provide innovative solutions to the industry challenges of the future."

At the 2017 Torch Awards, FIU honored Moss, whose company is an industry leader across all areas of construction management, as Alumnus of the Year.

Through the gift, FIU and Moss will create three endowments, among them, the Moss Foundation Scholarship Endowment, which will provide scholarships to FIU students, particularly those who are first-generation students, veterans, and/or disadvantaged youth.

The Moss School of Construction, Infrastructure and Sustainability Endowment will support four key areas: faculty and/or post-graduate research initiatives; student academic and industry endeavors; technology resources; and continuing professional education and industry programs, exhibitions, lectures, charrettes and master classes, as well as creative and research activities.

## Women in Engineering

### WOMEN of CEC

The Women of CEC is an initiative launched by the college to increase the number of women pursuing STEM careers, particularly in engineering. Although women fill nearly half of all jobs in the U.S. economy, they hold less than 25 percent of STEM jobs. The Women of CEC initiative consists of:

**Kick-off luncheons:** Held in the fall and spring to demonstrate to new students that the college is fully invested in their success

**FCA Women in Engineering Forum:** Held in the fall for this corporate partner to meet and recruit female students

**JP Morgan Chase Women in Engineering Forum:** A spring event that includes a panel discussion with four female executives and students

**Breaking Barriers:** A monthly online feature highlighting women engineers, computer scientists and construction professionals paving the way for women in the field.

### WOMEN in Advising

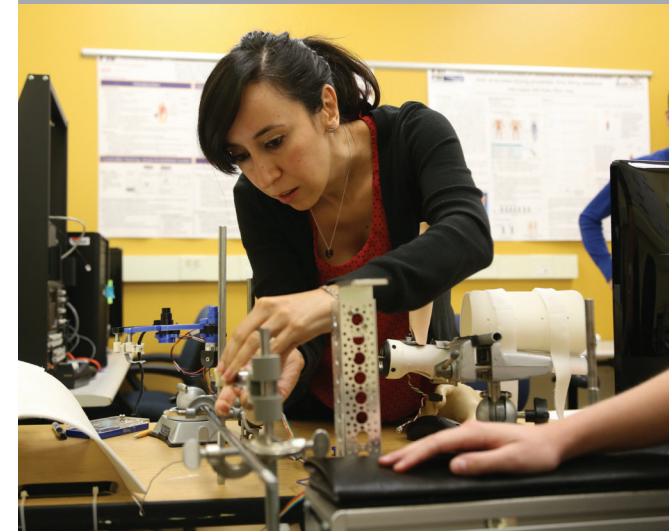
The Engineering Advising Center is committed to helping future engineers, including female students, succeed. The staff is made up of 15 advisors, 12 of whom are women. Meet one of them.



#### **Carmen Schenck**

As a child, Carmen was always fixing things that didn't work, and even taking them apart so she could put them back together again. She also excelled at math and science, so a career in mechanical engineering made sense, but it would take her years to reach her goal. Growing up in Caracas, Venezuela, she worked full-time through high school to help out her single mom with the family's bills. Any money left over, she'd save for college. When she graduated from high school, she went to England to learn English while attending school as a study-abroad student. She then came to the U.S. and spent some time on the West Coast, where she attended a community college and UC Berkeley for pre-engineering before coming to Miami to be closer to her mom, who still lived in Venezuela.

Carmen graduated from FIU with both her bachelor's and master's degrees in mechanical engineering. Undeterred, it took her many years, but at age 29, this first-gen student finally achieved her dream. Shortly after graduation, she was offered a job at CEC in Advising, with the opportunity to teach – a role she's had for close to 24 years. As a senior instructor and advisor, Carmen teaches Intro to Engineering, and advises students on their class schedules and career paths. She also encourages students struggling and the ones who want to give up, emphasizing the importance of education. Carmen has been married for 21 years. She and her husband have one son who's following in her footsteps. He's graduated summa cum laude and is now pursuing mechanical/aerospace engineering at University of Florida, and he has already completed an internship at NASA.



#### **Breaking Barriers**

Liliana Rincon Gonzalez is a biomedical engineering research scientist. With a background in engineering, neuroscience and psychology, she mentors several undergraduate and graduate students. She is also the research coordinator for a DARPA-supported first-in-human trial for a novel neural implant device to restore sensation to upper limb amputees. She works with all the regulatory aspects of the project, ensuring compliance, and obtaining approvals from the Institutional Review Board. Once amputee volunteers have enrolled in the study, Rincon Gonzalez will conduct several novel scientific studies on the restoration of sensory perception.





**Adalio T. Sanchez**  
*President, S Group Advisory, LLC*

**Adalio T. Sanchez** found tremendous success in business, and now he empowers students to pursue engineering careers by giving back to FIU’s College of Engineering & Computing.

For more than three decades, Sanchez held a variety of senior management positions with IBM. While there, a mentor said to him, “you’re going to be somebody here; what’s your cause?” The advice resonated with Sanchez and he realized that when you become successful in life, you can’t forget where you’re from. “I took that tap on the shoulder as my call to action to help my community.”

During this time – in the 90s – there was a STEM crisis in the nation, and FIU was graduating the greatest number of Hispanic engineers in the country, recalled Sanchez. As a Hispanic and first-generation student, he thought, “how do I help FIU do what it’s doing well and spread those success stories so we can help the Hispanic community become more engaged in the technical world?” As someone who obtained his engineering degree in South Florida, and an MBA (’87) from FIU, it was obvious to him he had to get involved.

As a result of Sanchez’s generosity, several significant major gifts are now in place to support first-generation Hispanic engineering and computing students pursue their career dreams. Their success is personal to him – Sanchez has worked since he was 13 years old, and received his engineering degree while simultaneously working full-time. He earned his degree in less than four years, and graduated with no loans, thanks to the money he earned and scholarships that funded his education. “I want to make it easier for others not to give up and to continue pursuing their career aspirations in technical fields.”

Today, Sanchez serves as president of S Group Advisory, LLC, a consulting business for technology companies that advises on strategy, technology and operational excellence. Prior to that, he ran a \$7 billion revenue business, which was sold to Lenovo Ltd., where he served as senior vice president of enterprise systems.

For Sanchez, it is his mission to help the community and nation bridge the digital divide, and support Hispanics so that they continue to contribute to the technical fabric of this nation.

**“Anything I can do to help students pursue STEM fields is my passion.”**



**Maria Quintero**  
*Brakes engineer, FCA US LLC*

**Maria Quintero** (’13) studied electronics engineering in her native Caracas, Venezuela. When she arrived at FIU in 2010 to study electrical engineering, her love for all things automotive led her to start a Formula One SAE chapter at the university. At the time, she didn’t know she would end up working for a major automobile manufacturer, FCA US.

Upon graduation, Quintero participated in the company’s Chrysler Institute of Engineering (CIE) program, a two-and-a-half year rotational program that allows aspiring auto engineers to work in different areas of the company. When she completed the program – designed to produce a well-rounded engineer – she was hired as a brakes engineer for the current and future generation RAM 1500.

In this role, she is in charge of design, development and release for the vehicle’s foundation brakes. Her job involves everything from working with suppliers to design the parts and coordinating with the manufacturing organization to install them correctly, to then going through production, quality control and testing performance.

As an FIU alumna, Quintero is a leader on the recruiting team at FCA US. The company plans year-long activities at FIU to recruit both interns and full-time hires. “We have had great success, not only recruiting on the engineering side, but also on the business side and in information technology,” she said. According to FCA US, due to the fact that FIU graduates the largest number of Hispanic engineers in the country, the university is a great source of diverse talent for their global company.

Quintero also played a major role in helping the college get resources for its Engineers on Wheels (EOW) program. The college is pleased to acknowledge The FCA Foundation’s (formerly The Chrysler Foundation) generous donation of the EOW van to take the STEM and engineering experience to local middle and high school venues, as well as support for EOW programming. FCA US sponsors the Society of Automotive Engineers (SAE) chapter at FIU, and provides feedback to the students working on their FSAE race car on a monthly basis prior to the international competition in May at the Michigan International Speedway. The company continues to collaborate with the FIU leadership team to develop students for post-graduation success and participates in university recruitment, the Women’s Forum, and STEM outreach events.

**“We have had great success, not only recruiting on the engineering side, but also on the business side and in information technology.”**



# Student Engineers EXCEL



**Jorge Cisternas '16**  
*B.S., Mechanical Engineering*

**Jorge Cisternas** always knew he wanted to be an engineer. His father is a computer engineer, but Jorge opted for mechanical engineering. He chose that discipline because it was hands-on, but he never imagined he'd end up working on airplanes. Through the Aerospace Engineering Club at FIU, he found his calling. As club president, he led team members in the building of an unmanned cargo plane that ranked third worldwide and second nationally in the SAE Aero Design Competition.

A natural leader, Jorge also served as a senator in the Student Government Association and in 2015 was named Senator of the Year by his peers. He created Town Hall meetings with the engineering dean, and also spearheaded the Engineering Showcase held in the Green Library Breezeway. There, engineering students showcased their projects, from model airplanes and cars, to bridges and robots.

After an internship with Lockheed Martin, a global aerospace, defense and security company, he landed a full-time job with the company. Jorge is a systems engineer in the F-35 Joint Strike Fighter program. His job is to create scenarios such as bad weather and engine loss for the flight simulators that pilots use for training.



**Somaye Fakharian Qom '16**  
*Ph.D., Civil Engineering*

A love for mathematics moved **Somaye Fakharian** to pursue a bachelor's degree in civil engineering while enrolled at the Iran University of Science and Technology. The Tehran native developed a specific interest in transportation after taking a few courses, and was told by professors it was a growing field, particularly in the U.S.

After she earned her master's degree, she got a job at the Department of Transportation in Iran. She worked there for three years, developing road incident management software and analyzing crash data, among other responsibilities.

When she decided to pursue her Ph.D., she applied to FIU after learning it had a very good reputation for transportation studies. Fakharian left behind her parents, and sister, in pursuit of education and research at the College of Engineering & Computing's Civil and Environmental Engineering Department.

Fakharian conducted research in CEC's Integrated Intelligent Transportation System (ITS) Lab, part of the Lehman Center for Transportation Research. She co-founded, in 2013, and served as president of a student chapter for Women's Transportation Seminar (WTS) at Florida International University (FIU). WTS is an international organization dedicated to the professional advancement of women in transportation. During her presidency, WTS International approved the FIU chapter, making it the organization's third official university chapter.

Today, Fakharian is helping transportation officials make decisions on the future of South Florida's highways, managed lanes and toll policies. While at FIU, Fakharian submitted 15 articles to journals and conferences in an effort to attract women scholars and transportation engineering agencies.

# Engineers on WHEELS (EOW)

This program brings FIU engineering students to South Florida K-12 schools. EOW provides students with hands-on activities and engineering experiments while exposing them to career opportunities in STEM (science, technology, engineering and math). The program features grade-appropriate, interactive lessons and presentations led by FIU students and overseen by FIU faculty. Subjects include mechanical and materials engineering, computer science and information technology, biomedical engineering, civil and environmental engineering, construction and engineering management, and electrical and computer engineering.



# Design Showcase

In Spring 2016, the College of Engineering & Computing hosted its first-ever Student Design Showcase at the Green Library Breezeway at the Modesto A. Maidique Campus. FIU student engineers showcased more than a dozen projects, including a 20-foot-long bridge welded from steel tubes, a concrete canoe, an eco car and even a plane, which placed third place at an international competition. Most of the projects that were showcased were initially designed for various regional, national and international club competitions, or as part of senior-design day at the college.



Faculty Spotlight

The following faculty members are being highlighted for making an impact in their fields, from winning national awards and starting companies to spearheading collaborations that are advancing their respective disciplines.



**Benjamin Boesl**, an assistant professor of mechanical and materials engineering, is the director of the composites laboratory and assistant director of the Advanced Materials Engineering Research Institute. His group’s research focuses on advanced materials development and characterization of materials using electron microscopy, work that in the past year has been supported by the Office of Naval Research, the Army Research Office, the Air Force Research Laboratory and the Federal Aviation Administration. Boesl received the Department of Defense’s University Research Instrumentation Program award in support of Navy-relevant research to install a high-temperature, depth-sensing nanomechanical test instrument known as a picoindenter, the first of its kind at a U.S. university. In 2017, he received the Top Scholar award from Florida International University.



**Stavros V. Georgakopoulos**, an associate professor of electrical and computer engineering, leads research focused on innovations in wireless power transfer and wireless communications. He is working to eliminate the need for batteries across a variety of devices, among them instruments that measure vital statistics and sensors that monitor environmental conditions when mounted on airplanes or cars. He holds multiple patents, including one for “origami antennas,” lightweight, easily deployed equipment of interest to both the military and private aerospace firms. Georgakopoulos has attracted funding from agencies such as the Department of Defense and the National Science Foundation and in 2015, received the President’s Council Worlds Ahead Faculty Award.



**Arindam Gan Chowdhury** is an associate professor of civil and environmental engineering and director of the Laboratory for Wind Engineering Research at FIU’s International Hurricane Research Center. Chowdhury is conducting groundbreaking research at FIU’s Wall of Wind research facility, which holds National Science Foundation designation as a national experimental facility, one of only seven such designated facilities dedicated to hazard mitigation research and one of only two dedicated to wind hazard research. Under Chowdhury’s direction, the team has worked to enhance building codes, validate innovative mitigation technologies and develop new materials. Chowdhury is the recipient of a Research to Application Award from the Florida Sea Grant Program. In 2012, he received the President’s Council Worlds Ahead Faculty Award, the highest honor FIU extends to a faculty member for excelling in research, teaching, mentorship and service.



**Niki Pissinou**, An Eminent Scholar Chair Professor of Computer Science in the School of Computing and Information Sciences, Dr. Niki Pissinou is responsible for research innovations that have significant impact on computer science, engineering, and telecommunications. As director of the Telecommunications and Information Technology Institute, which she founded in 2000, she oversees multi-year research projects for emerging and future technologies. Her current research focuses on protecting cybersecurity frontiers, including guarding social networks from insider colluding threats, mobile & systems security and privacy, trusted computing, survivability of time-critical systems, and data security and privacy. Her work has appeared hundreds of publications and is widely cited. Her research attracted millions of dollars in research funding from federal agencies, state governments and industry, including NSF, NASA, NSA, DHS, AFOSR, ARO and DoT.



**Jorge Riera Diaz** is an associate professor in the Department of Biomedical Engineering and director of the Neuronal Mass Dynamics Laboratory. His group’s research focuses on the development of methods for the integration of different brain imaging modalities. His current work centers on epilepsy in the animal model of the disease, specifically rats where he’s researching focal cortical dysplasia. The goal is to understand the inflammatory process and neurovascular coupling to help localize the specific area where epilepsy occurs in the brain. In the future, this information could help surgeons pinpoint the area in the brain and target surgical interventions in humans. Riera is currently collaborating with Nicklaus Children’s Hospital, and his research is funded by the National Institutes of Health. He also has a National Science Foundation grant to study cortical spreading depression in migraines. Another area of interest is autism where he has developed a brain computer interface to help children on the spectrum develop social skills through the use of a video game.



**Nipesh Pradhananga**, an assistant professor of construction management, is the director of the Moss and Associates Built Environment Informatics Lab at FIU. In the immersive, high-tech computer facility, he uses real-world data and case studies to create virtual simulations and explore new ways to improve occupational health and safety on construction sites. Pradhananga has also taken the lead in employing the lab for teaching purposes by convening classes there and requiring students to design various spaces using building information modeling, which provides a digital representation of physical and functional characteristics of a facility. The students enter all the required data to generate a 3D model that can be experienced in the lab either through projection onto walls or via use of virtual reality headsets.



Planned **STATE-OF-THE ART** engineering complex

FIU President Mark B. Rosenberg announced plans to build a new, \$150 million, 225,000 square-foot, LEED Certified Gold engineering building just south of the Modesto A. Maidique Campus. The engineering expansion would mean the graduation of an additional **350 engineers annually** and the **creation of 550 jobs in South Florida**.

In addition to graduating more engineers and spurring job creation, the expansion would increase research expenditures by \$30 million annually, and allow for the submission of 27 additional patent applications per year. With the addition of the new building, the **College of Engineering and Computing would grow from 2,061 students to 7,500**, and increase faculty from 105 to 214.

FIU wants to increase the number of engineering graduates by **20%** by **2020**.

*“This engineering expansion will propel South Florida forward by expanding the quantity and quality of jobs, nurturing start-up companies and acting as a collaborative research center. We get it! FIU is a solutions center and we’re determined to do our part to create a tech hub in Miami that will contribute to the prosperity of our region and our state. We’re passionate about developing and keeping talent in our community.”*  
–FIU President, Mark B. Rosenberg

Building **COLLABORATORIES**

- Office of the Dean - Renovation
- Advising Center – Renovation
- Office of Student Access and Success (OSAS) – Renovation
- Tech Station - New
- I-CAVE - New
- Active Learning classroom - New



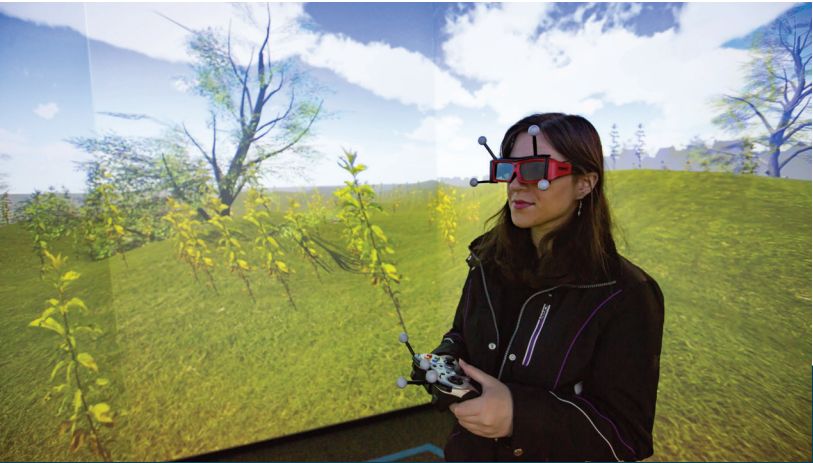
**Tech Station**  
A **\$3 million, 8,000 sq.ft hub** for **technology innovation**, training and community engagement built to attract the next generation of top computing students

**I-CAVE**  
The Integrated Computer Augmented Virtual Environment (I-CAVE) is an **instructional and research visualization facility** that allows for 2-D and 3-D visualizations of scalable data and a completely immersive experience in a virtual space.



**Advising Center**  
New space features modern furnishings and **allows advisors to better serve engineering students**

**Active Learning Classroom**  
This new state-of-the-art classroom features **collaborative team tables with a 42-person capacity**. Students can check out laptops for use in the classroom, which is designed to provide instructional and digital infrastructure to promote active student engagement in project and problem-based learning.





ACADEMIC

According to the 2015 ASEE report\*:

FIU is **#2** in the U.S.  
preceded only by Puerto Rico in  
awarding B.S. degrees to **Hispanics**

**#51**  
in awarding B.S. degrees  
to **women**

**#8**  
in awarding B.S. degrees to  
**African-Americans**

\*Out of 365 colleges and universities

**88%**  
**Record-setting year** high in FTIC 2<sup>nd</sup> Year Retention Rate

**201** First-Generation Graduates in **2015-2016**

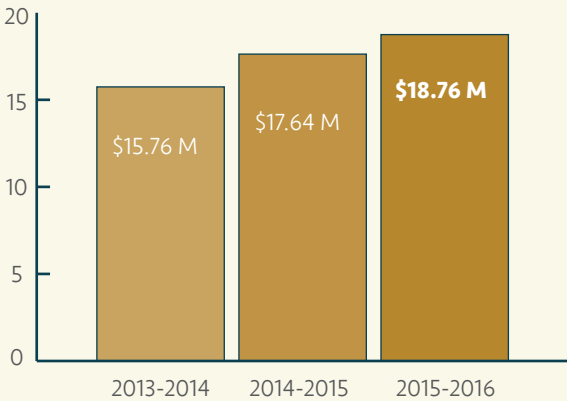
**577** bachelor's degrees  
**awarded to minorities**

**5,442**  
Total student  
**enrollment**

RESEARCH

**Record-setting year**  
for research awards  
**\$19.82M**

Continued **growth** in annual  
**research** expenditures



**HERD Rankings**  
2015 data:  
**#71**  
in federal research expenditures

**15** patents  
issued 2015-2017

**30+** faculty fellows

**20** faculty hires  
6 of whom are women

CEC  
in the News

**FIU News:**  
**55**  
stories

**External News Outlets:**  
**181**  
print and broadcast stories

Making **Headlines** In:

**LOCAL:**  
The Miami Herald  
El Nuevo Herald  
Palm Beach Post  
Sun-Sentinel  
Florida Trend  
CBS 4  
NBC 6  
WSVN 7 (FOX)  
Univision  
Telemundo

**NATIONAL:**  
ASEE First Bell  
ASEE Prism Magazine  
Forbes  
MSN  
NAE News Radio - WTOG  
Newsweek  
Science  
Smithsonian  
Time  
Weather Channel

(News coverage from  
April 2016 to April 2017)





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