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## Industry partnerships benefit college, companies

### Haas Automation

In 1997, Stewart Prince, professor of mechanical engineering, was awarded an NSF grant to develop a paperless machine design facility—one where students could do all their design work on computers and then produce the parts using CNC machines and rapid prototypers. In shopping for the CNC machines, Prince approached Haas Automation, the largest machine tool builder in the United States, to see how far the grant funds would stretch. The company, located in Oxnard and founded by CSUN alumnus Gene Haas, responded with a unique proposition: instead of selling the machines, it would entrust them to the college, as long as they were incorporated into the curriculum. And thus the Gene Haas Machine Design and Manufacturing Lab—and a fruitful ongoing partnership—were born.

The new 2,000-square-foot lab was dedicated in October 1998, enabling the department's 300 students to design and manufacture parts for assignments and projects. And under the terms of the agreement, every couple of years since, Haas has come in, evaluated the college's needs and replaced the existing machines with the newest, state-of-the-art technology.

"We have completely integrated these machines into our curriculum, so almost every student in our program is exposed to the Haas machines,"



says Prince, who continues to oversee the lab. "And it's in Haas's best interest to make sure we have the latest and best machines. We create mechanical engineering students, not technicians, so the students who come out of here will be mechanical engineers who work at Haas designing the CNC machines of the future. Haas can select its employees from among our students, and that's how it benefits."

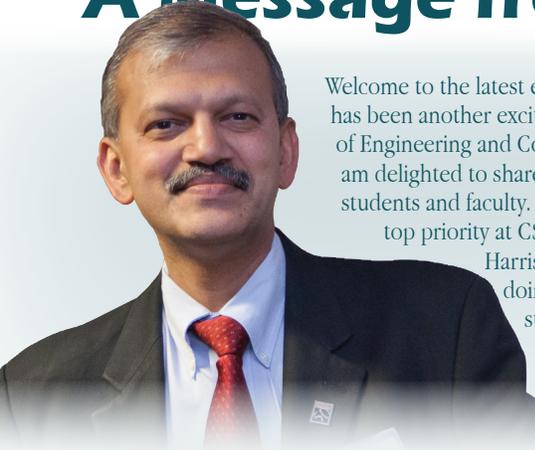
Today there are more than 750 students in the mechanical engineering program, and the lab has grown to 5,000 square feet, divided into two halves—one devoted to fabrication, where students make parts, and one where they work on their senior design projects, including the Human-Powered Vehicle, Unmanned Aerial Vehicle, Formula SAE car, and Intelligent Ground Vehicle.

"Students are using the machines to make incredible products," Prince says. "They love it because they can see their products come to fruition."

The CSUN lab is part of a network of more than 2,000 Haas Technical Education Centers worldwide, mainly at community colleges and universities, where the company either provides machines through an entrustment, as it has at CSUN, or allows the institutions to purchase them at a deep discount.

"Because CSUN is also the alma mater for Gene Haas and it's close to home, we support it at a higher level, primarily with equipment and any technical support we can give," says Peter Zierhut, Haas's vice president for European operations, who also manages the company's educational programs. "We also show up at TechFest and job fairs and regularly hire students from CSUN."

# A Message from the Dean



Welcome to the latest edition of Spectra! It has been another exciting year in the College of Engineering and Computer Science, and I am delighted to share the successes of our students and faculty. Student success is our top priority at CSUN, and under President Harrison's leadership, we are doing everything we can to support our students to be successful in their lives and careers. Our students are doing a spectacular job in regional and national

competitions, earning laurels for their hard work and dedication. Industry has noticed, and the headline stories in this issue highlight the value and significance of our partnerships, which are a strong testament to the quality of our academic programs.

This was a busy year for our faculty and staff as we hosted ABET for a site visit in fall 2013 for a review and reaccreditation of six undergraduate degree programs in our college. The review team complimented us on several strengths, including the quality of our academic programs, our students, our ongoing efforts to enhance student learning, the dedication and commitment of our faculty and staff, the outstanding support we receive from industry, and our excellent labs and facilities. The visit was very successful, and we will officially hear from ABET following the Commission meetings in summer 2014.

Our overall enrollment was close to 4,000 students in fall 2013, and we continue to graduate approximately 500 students every year with bachelor's and master's degrees in a wide array of disciplines in engineering and computer science. Among other firsts, we graduated our very first cohort with master's degrees in assistive technology engineering in fall 2013—many of whom were receiving career offers within days. With the exponential growth of the college, we are actively recruiting faculty in all our departments, with eight open searches as of now. Programs such as Tech Fest, the annual Senior Design Project Showcase and the Brown Bag Research Seminar series provide a strong foundation to strengthen collaboration with industry. We are working with LACI ([www.laincubator.org](http://www.laincubator.org)) to establish a satellite incubator on campus to promote startups in a variety of areas. Also in this issue you will enjoy reading about faculty who are exemplary teacher-scholars, engaging students in exciting research projects and enhancing their learning experiences. We have been averaging approximately \$2.5 million annually in research grants and contracts over the past two years and expect that we will continue to grow and expand our efforts in the coming year.

Much of what we do in the college would be impossible without the dedication of our faculty and staff and committed support from our numerous alumni and donors. The alumni networking event in fall 2013 was a great success, with over 100 alumni participating. Our alumni are our "eyes and ears" in the community, and we are working to establish a strong alumni chapter to engage them in the coming year. We are looking forward to another record-breaking year as we continue in our quest to serve our students with academic programs of the highest quality! Thanks once again and happy reading! ☺

*S. K. Ramesh*  
Dean S. K. Ramesh

## Industry partnerships benefit college, companies

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In recent years, the company has begun to support the school with financial contributions as well. Through the Gene Haas Foundation, it began providing program funding in 2004, and last year supported an assistant technician for the lab, as well as several student projects and scholarships.

"The Haas corporation and Gene Haas in general have been very, very good to us," Prince says. "We're very grateful."

While Haas Automation may be one of the college's most visible industry partners, it is by no means the only one, and over the past year, several other partnerships with area companies have been formalized, expanded and solidified.

### Jet Propulsion Laboratory

Jet Propulsion Laboratory, like Haas, has longstanding ties with CSUN, but as part of a larger initiative to ramp up its partnerships with universities, it is seeking to expand the relationship.

"What JPL is trying to do is develop relationships with universities so we actually can get to know the professors and the curriculum and see if we can target certain areas for involvement," explains Naomi Palmer, section manager for JPL's power and sensor systems and its newly appointed university relationship manager for CSUN.

Broadly speaking, Palmer's charge is to establish more of a presence for JPL on campus, with an eye toward recruiting CSUN students as JPL employees. As part of this effort, she is trying to connect with some of the student engineering organizations, hoping to arrange for a group of female engineers to talk with the CSUN chapter of the Society of Women Engineers, for example, and have someone from JPL speak on campus about the latest developments at JPL. In addition, she was recently inducted into HKN (Eta Kappa Nu), the engineering honor society, with the understanding that she will support one event every year.

"We're trying to create a pipeline—to identify students, hopefully early enough in their schooling, so they can come into JPL as summer students and see if they like it, and we can see if we like them," she says. "We'll bring them back the next summer if they do well. Or if they're graduating, we can bring them in as employees. If they're local, we can try a part-time position. It should be ongoing year after year."

A collaboration between the college and JPL is already providing an outstanding opportunity to do exactly that. The CubeSat project with Sharlene Katz, professor of electrical and computer engineering (see page 8), opened JPL's doors to four of the six students who worked on it last year (the other two had other commitments). The four students had summer jobs there and were brought back for part-time jobs during the



CubeSat team members with JPL manager, Naomi Palmer and the FlatSat demonstration. From left, George Randel, Rufus Simon, Steven Parks, Kyle Figatner, Joseph Zitkus, David Castro, Robert Cholvin, Naomi Palmer (JPL), Arnold Martinez, Andy Kurum and James Downs

academic year. Twenty students are currently working on the CubeSat project, and Palmer has asked Katz to approach the top candidates to see if they too want to work part time at JPL.

“I’ve been recruiting for a really long time, and I think JPL is trying to formalize this new program,” Palmer says. “We’re always looking to collaborate with universities.”

## LEAP Employer-Educator Compact

In 2012, a group consisting of presidents from all sectors of higher education initiated the LEAP Employer-Educator Compact, an effort to bring together college presidents and leading employers of college graduates in order to support the goals of the Association of American Colleges and Universities’ LEAP (Liberal Education & America’s Promise) initiative. At a forum held in Washington, D.C., last April, more than 200 leaders in business, higher education and the nonprofit sector gathered to endorse the compact, which affirms their shared commitment to 1) the learning college students most need both for the economy and for democracy; 2) 21st-century designs for high-quality, hands-on learning that prepare students to deal with complexity, diversity and change; and 3) the development of meaningful evidence about students’ actual achievement in college.

At CSUN, the compact has gained traction with two longtime CECS partners: Aerojet Rocketdyne and Boston Scientific. To some extent, though, it is merely putting a formal name to what both companies have been doing for some time.

## Aerojet Rocketdyne

“We’ve supported these kinds of initiatives at the college for quite a while before we called it LEAP,” says Chris Erickson, Aerojet Rocketdyne’s chief engineer for energy and advanced programs and a member of the CECS Industry Advisory Board. “We have been very active.”

Aerojet Rocketdyne is particularly interested in technical collaborations, he notes, adding that the company supported a successful collaboration with mechanical engineering professor Bob Ryan and his students involving an advanced phase change pressurization system. Another collaboration, with Rais Ahmad, assistant professor of civil engineering and construction management, is exploring ultrasonic leak detection (see article, page 12).

With more than 250 CSUN alumni working at Aerojet Rocketdyne, the majority from CECS, the company has a powerful stake in these collaborations. Most of the projects involve students and are an effective way to determine whether Aerojet Rocketdyne should hire them as

permanent employees once they graduate. A steady stream of CECS interns has provided similar insights.

“We reviewed the LEAP Compact item by item, and we were already doing those things,” says Erickson. “Really what we’re doing is packaging them under the LEAP umbrella. I think it’s a good initiative, and the company is very much behind the university alliance.”

## Boston Scientific

Boston Scientific is likewise firmly committed to the principles of the LEAP Compact but is still hammering out the details of the arrangement with CSUN.

“It’s not a formal agreement,” explains Milad Girgis (’97, Mechanical Engineering; MS ’01, Engineering Management), vice president of international sales and program management and Boston Scientific’s Deep Brain Stimulation program. “It was a case of going to the CSUN president and saying, ‘We really believe in this type of education and would like to help the university in things like this.’”

That said, the company is eager to develop more internships, honors co-op placements and other hands-on opportunities for CSUN students.

“The way I understand it, LEAP is trying to use the compact to develop more curriculum and get industry buy-in for a more cross-functional experience,” Girgis says. “And because we have people from engineering, marketing, regulatory affairs, etc. when we’re developing a new product, that’s definitely something Boston Scientific supports.”

## Northrop Grumman

Early in 2013, Northrop Grumman, another longtime partner with the college, also decided to be more strategic in its approach to university grantmaking and recruiting. Previously, it had designated 15 or so universities nationwide as Core University Partners—well-known institutions renowned for producing high-caliber students and for conducting cutting-edge research, according to Charles Volk, vice president and chief technologist for Northrop Grumman Navigation Systems, and a member of the college’s Industry Advisory Board. But a number of people in the company, including Volk, had been lobbying to expand the list to include “backyard” schools like CSUN—universities that are near Northrop Grumman campuses and are a source of employees and collaborations.

“It’s a natural place to recruit from, and it’s a key school to me because it’s a large contributor to the employee base here—both new hires and people looking to advance their careers,” Volk says. “A number of Northrop Grumman employees with bachelor’s degrees go to CSUN to get their master’s degrees.”

When the revised list of Core University Partners came out a few months later, the number had expanded to 53, and CSUN had made the grade.

“Northrop Grumman has four sectors and does business in 50 states, plus internationally,” says Peggy Nelson (MS ’91), vice president of engineering and global product development in the company’s Aerospace Systems Sector and a member of the Industry Advisory Board as well. “Often we will find ourselves approaching a university multiple times from different sectors. What the company decided in order to focus money for grants and recruiting was to create a set of core universities so it could approach the gifting of money and recruiting of employees in a more integrated way across the company.”

The new Core University Partners were selected by a panel that looked at 1) whether the university was ABET accredited; 2) the university’s

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# IAB Highlight

## Different backgrounds, a common purpose

One attended CSUN, the other did not. One is an electrical engineer, the other a chemical engineer. Their shared interests, however, are more significant than their differences. Both hold senior positions with major aerospace and defense companies. Both have a deep commitment to advancing engineering and a keen interest in future of the College of Engineering and Computer Science, its students and faculty. And both serve on the CECS Industry Advisory Board (IAB).



## Chris ERICKSON

Chief Engineer  
Energy & Advanced Programs  
Aerojet Rocketdyne

Chris Erickson, chief engineer for energy and advanced programs at Aerojet Rocketdyne, joined the IAB in 2009, but he was already well known within the college. For several years, he had been substituting when Aerojet Rocketdyne's existing IAB member couldn't make the meetings. He really enjoyed the work, so he was happy to make his role official when the other member moved on to another position.

"I liked being on campus and seeing students learning and professors very engaged," he says. "I enjoy the relationships with the faculty and dean. I find it rewarding to stay in touch with academia." As an IAB member, Erickson brings enthusiasm, insight and experience to meetings. A Chicago native who did his undergraduate work at the University of Illinois and earned his master's degree in chemical

*"We're very impressed with the quality of the CSUN engineering and computer science grads."*

engineering at UC Berkeley, he has 35 years' experience with Aerojet Rocketdyne, supporting propulsion and energy programs. He was Aerojet Rocketdyne's 1996 Engineer of the Year and holds four patents in innovative rocket engine power cycles. He also sits on the board of the CSUN Foundation and recently received a campus Volunteer Service Award.

Through the IAB, he is an advocate for the college and an effective liaison between CSUN and Aerojet Rocketdyne. "One of the advantages is that we can inform the university of exactly what we're looking for in a graduate, and we can help direct curriculum and help prepare students for our type of careers," he says. "Plus it's a real opportunity to serve as conduit for excellent talent for employees. And some of our engineers do guest lectures, and the collaborative efforts have been very fruitful too, developing technology together."

Erickson believes the IAB is making a difference at the college, enhancing the program and enjoying many benefits in return. Moving forward, he'd like to have even more impact by expanding the collaborations between CECS faculty and Aerojet Rocketdyne engineers. There are more than 250 CSUN alumni at Aerojet Rocketdyne, and he also envisions getting some of them involved in IAB activities, such as guest lecturing at CSUN and bringing CSUN faculty to Aerojet Rocketdyne to give talks.

"We're very impressed with the quality of the CSUN engineering and computer science grads," he says. "They have a really good grasp of the theoretical but good hands-on capabilities as well. Plus they're good communicators, so they have risen to various positions of leadership here. They're a big part of the company, and we want to bring more like them to Aerojet Rocketdyne in the future."



## Peggy NELSON '91

Vice President of Engineering and  
Global Product Development  
Northrop Grumman Corporation  
Aerospace Systems

**P**eggy Nelson, vice president of engineering and global product development for Northrop Grumman Aerospace Systems, is no stranger to CSUN, having earned both a teaching credential and a master's degree in electrical engineering there. In the early 1980s, she was part of a cutting-edge program organized by Women in Science and Engineering in partnership with ten companies and CSUN, which sought to recruit professional women in math or science and bring them back to school to become engineers.

***"It was my alma mater doing good things, and I have a lot of appreciation for what the university did for me."***

Nelson, who had earned her undergraduate degree in mathematics at UCLA, was teaching high school math at a private school when she learned of the program. She enrolled in the College of Engineering and Computer Science, and TRW (which later became part of Northrop Grumman) paid for her education, gave her a half-time internship and then hired her full time after graduation.

"I'm very appreciative of the fact that in the 1980s, the university was really innovative in stepping out in the area of diversity," she says. "That program was pivotal for me."

Nelson has now been a program manager at Northrop Grumman for about 25 years and a vice president for ten years, leading an organization of 9,000 engineers. About a year and a half ago, the college reached out to her and asked her to join the IAB. "I thought about it and said I would be willing to do it," she says. "It was my alma mater doing good things, and I have a lot of appreciation for what the university did for me."

Being on the IAB has enabled her to stay networked with others in industry and with thought leaders in engineering, as well as remain connected to the college. It has also helped expand the relationship between Northrop Grumman and CSUN in order to build the pipeline of engineering talent. She's particularly interested in seeing the board address the retention of women in engineering. "When I joined TRW in 1983, I was the first technical woman in the lab," she recalls. "How do we as companies create an environment that can accommodate women and some of the things they may want to accomplish outside their jobs?" she says.

She's also eager to see the IAB reach out to incoming freshmen, particularly those who are first-generation college students, to help them understand what they

need to accomplish at CSUN to be successful in college and careers. "Those students don't have a support system at home for learning these things," she says. "The IAB can help them understand what can make them better candidates for a company like Northrop Grumman to hire. For example, if you're first generation and working to put yourself through school or supporting your family, do you take an extra year but get better grades, or do you hurry and take as many classes as you can and get worse grades but finish faster? The answer is that employers care about GPA."

And finally, she'd love to see the IAB's membership expanded and diversified, which she believes will benefit the college. "With the budget, the universities are really going to have to improve their sources of revenue," she says, "and expanding the IAB can only help in that regard." ❖

rating in *Princeton Review*, *U.S. News & World Report*, etc.; 3) what its STEM outreach program was like (an especially important factor to Northrop Grumman, which wanted to see institutions working with high schools to promote the importance of engineering); 4) the diversity of the university; 5) its strengths in the disciplines that Northrop Grumman does business in, especially electrical and mechanical engineering and software; 6) the company's history of hiring and retaining students from the university; and 7) whether the university's research aligned with Northrop Grumman's R&D.

CSUN's engineering program rated well, according to Nelson; its STEM program is good, and the employees who come to Northrop Grumman from CECS tend to do very well. Moreover, with the number of women in technical fields declining, the college's history of innovative programs in diversity was a decided plus.

"We're hoping that by establishing a set of partner schools, we can approach them in a consolidated way across business units and hire the best and brightest," says Nelson. "We're also hoping the universities will try to align their senior projects with experiences that will help facilitate students' growing skills in our business base."

Moving forward, Northrop Grumman will continue to partner with the university. Volk doesn't anticipate major changes in how he deals with the college. He already has a longstanding relationship with CSUN, donating equipment and time and helping the university prosper so that Northrop Grumman has a well-educated workforce that is ready to go to work quickly. He also actively tries to sponsor projects in areas of interest to him.

"By working closely with the university and having students understand what they are doing before they come to work, it reduces the learning curve," he says. "People who have worked on projects of interest to us will be contributing faster than those hired out of some other school without that relationship."

Whether it's internships or research collaborations, student project sponsorships or donations of equipment, it's clear that industry partnerships are critical for the college and for the corporate partners. And in the end, everyone wins—students, faculty and the companies themselves. ❖

# ALUMNI SPOTLIGHT

## Kunal Chitre:

### CECS degrees have given his career a running start



It's a long way from the Indian state of Maharashtra to Los Angeles, but for Kunal Chitre (MS '05; MS '09), it has proven the shortest distance to his career goals. Chitre's father is an engineer, and he always knew that he would one day be an engineer as well. So ten years ago, he left his hometown of Nagpur to pursue a master's degree in electrical engineering at CSUN. Of the several U.S. universities he had applied to, CSUN was the first to accept him. Not only was it affordable, he says, "but it was close to Hollywood"—a decided bonus for a self-avowed movie buff.

Chitre entered the university in 2003, and as a student, he began working for Physical Plant Management on campus, managing the department's technology infrastructure for over 300 users, including day-to-day IT operations. He was also involved with special engineering projects.

**"A lot of the projects they assigned were very relevant and useful—things I could immediately draw upon in my career to be successful."**

"My job with Physical Plant Management was one of the best things that ever happened to me," he says. "I got dragged into little projects that gave me experience on so many levels. I don't know if it was destiny or simply luck, but I chose communications and optics as my minor within electrical engineering. I got involved in a fiber optics project on campus, and that eventually led to the college's first fiber optics lab. It was an amazing experience, interacting with so many wonderful people across the board. I really enjoyed being on campus—and still do."

Chitre earned his master's degree in electrical engineering with honors in fall 2005 and continued working for Physical Plant Management. His job was not permanent, however, and he needed a full-time job with an employer willing to sponsor his work visa. As part of a special engineering team,

he designed an interactive touch-screen kiosk for a 1 megawatt fuel cell project on campus. Staff from Digital Energy, Inc., a company that was working with CSUN, were impressed with his work on the project and offered him an internship that eventually led to his full-time employment with the company.

For many people, landing a good job with a respected firm would have been enough. But in 2007, the same year he started at Digital Energy, Chitre returned to CECS to enroll in the engineering management master's program. The reason, he explains, is that after finishing his master's degree, he realized that he had strong technical skills but no formal education in managing projects or people.

"It dawned on me that if I wanted to grow, manage technical projects and continue to do amazing things on a bigger scale, I needed that people perspective and a formal management education," he says. "I looked at quite a few programs, and engineering management was a very good fit, so I decided to pursue it."

Chitre earned his second master's degree, in engineering management, in 2009 and has continued to apply what he learned from his education at Digital Energy, where he has worked on numerous energy, sustainability and software projects. Lately, much of his work has been in software engineering as it pertains to facilities and energy management, and he designed and developed the company's most successful smart meter data management products and services.

At the same time his career has been taking off, Chitre has remained active at the institution that made it all possible. "I've stayed involved with the campus even after I graduated because the company does quite a few projects with CSUN—that's on the professional side," he explains.

From an alumni standpoint, he regularly attends campus events, was the keynote speaker at the 2013 CECS commencement and attended the last CREST conference (see page 17), to name just a few examples. On his own time, he golfs, is a wine connoisseur and enjoys watching action movies. He also loves to stay abreast of new technologies and writes mobile apps for fun. In addition, he is working on his Spanish language skills.

"I'm at a point where at 32 years old, I reflect upon decisions I've made that have catapulted my life in a certain direction, but there is so much more that I want to do," Chitre says. "I have the advantage of just starting to be in the prime of my life and career, and I intend to take full advantage of it." ❖

# Asad Madni, CECS friend, colleague and champion, awarded honorary doctorate



CSUN paid tribute to one of the college's most steadfast and distinguished friends last May, when the university presented Dr. Asad Madni with an honorary doctorate. Madni, a prolific and pioneering researcher, influential business executive, generous civic leader and member of the National Academy of Engineering, has shared his knowledge, passion and commitment to education with the university and the college for more than two decades.

An internationally recognized authority on the development and commercialization of intelligent sensors, systems and instrumentation, Madni earned his B.S. and M.S. from UCLA and his Ph.D. from California Coast University. His initial contact with CSUN came in the mid-1970s, shortly after he joined Systron Donner Corporation's Microwave

Division in Van Nuys, where he held a series of senior technical and executive positions and eventually became chairman, president and CEO of the corporation.

"We were looking to formalize our educational program for technicians, engineers, scientists and other employees," he says. "We wanted a university that taught relevant subjects, had excellent faculty, was convenient to attend and had an environment that was conducive to collaboration. It was not very difficult to conclude that CSUN possessed those qualities"

At Systron Donner, Madni made seminal contributions to the development of RF and microwave systems and instrumentation. In 1992, after Systron Donner was acquired, he joined the resulting company, BEI Technologies, Inc., where he served as president, chief operating officer and CTO, remaining until his retirement in 2006. Under his leadership, the company's technical advances found their way into the Hubble Space Telescope and passenger vehicles around the world.

While at BEI, Madni became more involved at CSUN, serving on the Industry Advisory Boards of both the Tseng College and the College of Engineering and Computer Science and helping to revive a dying IEEE student chapter. He facilitated alliances with local, regional and national engineering programs to improve teaching and research and also led the development of certificate programs.

"Dr. Madni's contributions have helped retrain several engineers for placement in industrial and commercial sectors," says CECS dean S.K. Ramesh.



President Dianne Harrison presents Asad Madni with his honorary doctorate at the college's 2013 commencement ceremony.

He has been especially effective in his work with students, mentoring graduate and undergraduate CSUN students and serving on thesis committees. Some have gone on to international renown.

Highly respected in the financial community as a creative and visionary leader, Madni is currently an independent consultant; distinguished adjunct professor and distinguished scientist in electrical engineering at UCLA; distinguished college professor at the TCI College of Technology in New York; adjunct professor at Ryerson University; and executive managing director and CTO at Crocker Capital, a venture firm specializing in emerging technologies.

Madni has been recognized countless times with awards and honors from national and international organizations. At a luncheon on May 22, in the presence of family, friends, colleagues and some of his former students, he received yet another: an honorary DSc. from CSUN, awarded by the CSU Board of Trustees.

"It was extremely gratifying to know that somebody realized the value of the contributions I made," he says. "I was humbled and very grateful." ❖

# Design Clinics: Hands-on projects teach students, advance technology

With the concentration of talent, expertise and enthusiasm within the College of Engineering and Computer Science, it's no wonder that outside organizations regularly call on CECS faculty and students for help with research, product development, testing and problem solving. Sometimes the organizations themselves initiate the projects; sometimes CSUN faculty do. Sometimes these collaborations take place through the college's design clinic program, other times through research grants or contracts. Regardless of their origins or funding mechanisms, these projects are invaluable opportunities for students to experience working with professionals on real-world projects.

## Preparing for orbit

Its name is CSUNSat1, and it's what is known generically as a CubeSat—a micro satellite measuring 10x10x20 cm, roughly the size of a shoebox and weighing about five pounds. After designing, building and testing the CubeSat, the CSUN project team will work with NASA to get it launched into space.

"You'll have your own satellite circling Earth," explains Naomi Palmer, section manager for power and sensor systems at Jet Propulsion Laboratory.

Last spring, as part of a design clinic, JPL collaborated with electrical and computer engineering professors Sharlene Katz, Jay Flynn and David Schwartz, plus six students in the department, on a CubeSat project. The aim was to teach the students what a CubeSat is, how it works, what it takes to fly one and what the micro-satellite can do. At the end of nine months, the team presented a working prototype, including a ground station, to JPL.

That project was only laying the groundwork for a larger and more ambitious CubeSat project, however. In August, Flynn, Katz and Schwartz, in partnership with JPL, were awarded a two-year, \$200,000 NASA SmallSat Technology Partnership Grant. The grant also includes funds for JPL engineers and scientists to collaborate with the CSUN team. The purpose of the program is to develop and demonstrate new technologies employing the unique features of small spacecraft for science, exploration and space operations. The CSUN grant was one of just 13 awarded nationwide, out of more than 100 applications.

CSUNSat1, as it's been dubbed, will carry a JPL energy storage experiment into orbit about 500 miles above the earth. Over several months, it will downlink data from the experiment to a ground station



Matthew Keyawa, Nicholas Keyawa, William Cannon

on the roof of Jacaranda Hall on the CSUN campus. The CSUN team—consisting of over 20 seniors and graduate students; Katz, Flynn and Schwartz; plus Adam Kaplan from the computer science department—is responsible for

construction of the satellite and design of the radio, sensor electronics and power system, along with the satellite's main computer programming. The group will carry out all testing of the completed satellite and will also design, build and operate the ground station. JPL, with Palmer as the liaison, is responsible for design and construction of the experimental payload, which will validate a new technology that will allow longer missions farther from the sun.

"The students are getting a unique experience—the opportunity to build a satellite and get it launched and get signals from the ground station," says Katz. "It's not the kind of thing they get to do every day."

The students' participation will fulfill their senior or graduate project requirement.

## Enterprise computing: Back to the future

In the old days, computers were massive machines, and it took an army of programmers to keep them running. Because these older machines are very reliable and fast, however, demand declined over time for professionals trained in the technology.

Flash forward 40 or 50 years, and today even microcomputers are giving way to mobile computing on smartphones and tablets. Nonetheless, some things haven't changed: major corporations still need large, powerful mainframes capable of running thousands of transactions a minute, whether it's to make sure the corner ATM is operational and your account is protected from fraud, or to allow you to buy airline tickets online or complete an insurance transaction.

"And the tide has turned now," says Shan Barkataki, professor of computer science "So few universities teach mainframe technologies that now there is a big demand for students so the industry can survive."

The term *enterprise computing* refers to technologies used by large companies, government, the healthcare industry, insurance companies, etc.



Back row from left: Students William Cannon, Paul Jessen, Sharlene Katz (faculty), David Castro, Nicholas Keyawa, Warren Kaye. Front row from left: James Flynn (faculty), students Matthew Keyawa, Kyle Figatner, William Fisher, Aaron Lawson, Edras Lepe-Zapata, Kevork Sepetci

“It’s a graybeard environment,” Barkataki says. “A lot of people who know how to do this are retiring.”

Moreover, companies using the mainframes have not established a sunset date for the software that runs on them, which is written in COBOL. They are planning to use it indefinitely and need people to maintain it as laws and business requirements change.

Last year, the health insurance giant WellPoint was concerned enough to fund a design clinic to help Barkataki and four students set up a lab to maintain interfaces with mainframe computers and develop interactive course modules in enterprise computing. Because CSUN does not own a mainframe, it was necessary to establish a system to access mainframes at other universities and computer centers. The students themselves wrote the course modules in consultation with Barkataki.

“These four students had jobs almost as soon as they graduated,” Barkataki says. “They are earning good money and have good jobs because they got exposed to mainframe technology.”

The plan is to hire four more students and have them do research in newer technologies as well as help deploy the course modules in classrooms. “It’s a good investment, and students benefit,” Barkataki says. “And we can share what we’re doing with other universities.”

## Antenna Measurement Lab: Computer-aided processing

Think of it as Photoshop for antenna measurement—computer augmentation of data collected to assess different aspects of antenna performance. That’s the concept behind the project proposed by Ronald Pogorzelski and Sembiam Rengarajan and recently funded by the U.S. Army. Pogorzelski, an adjunct faculty member in the Department of Electrical and Computer Engineering, and Rengarajan, a professor in the department, received a Short-Term Innovative Research (STIR) grant to develop computational methods and algorithms for post-measurement data processing.

The army must assess its antennas to verify that they meet specifications, and to accomplish that, it has built highly sophisticated, very costly facilities. But Pogorzelski and Rengarajan’s premise is that the capabilities of today’s computers are so much greater than those of computers 20 or so years ago that it might be more productive to collect data using more modest instruments and then process it through a computer afterward to improve the results.



Sembiam Rengarajan

“You can spend a lot of money trying to make a measurement system as nearly perfect as possible,” Pogorzelski says. “But once you buy the computer, it’s essentially free to use, so you

can spend hours if need be, massaging raw data to reveal features you couldn’t otherwise see in it.”

If Pogorzelski and Rengarajan’s approach is successful, it should become more efficient and far more cost-effective to carry out assessments



Shan Barkataki

computationally rather than spend large sums of money to build new antenna measurement facilities.

The pair are currently developing the techniques and trying to determine the capabilities and limits of their concept. As part of the project, they have been having some of the instruments in the college’s aging Antenna Measurement Lab refurbished so the lab can serve as their primary test bed. They are also hoping to borrow and test antennas from area companies to ensure that their techniques are as widely applicable as possible.



Ronald Pogorzelski

The project does not currently involve students, but once the lab has a working set of equipment, the two hope to put together an undergraduate lab course in antenna measurements—a subject that is usually reserved for graduate-level studies. For now, however, they are focused on fulfilling the terms of the grant, which began September 1 and runs through the end of May 2014. If their results are as good as they expect, they may be able to leverage the findings for additional funding.

## The power of light



Somnath  
Chattopadhyay

Last year, Somnath Chattopadhyay, a faculty member in electrical and computer engineering, received a three-year grant from the Department of Defense Army Research Office to develop an optically controlled silicon carbide/gallium nitride-based MESFET (metal semiconductor field effect transistor). The device, which will control the actuators in an airplane’s onboard power system with UV light rather than electrically, has several advantages: the system won’t be disrupted by radiofrequency or electromagnetic fields; it will potentially lighten aircraft by 30%; and it will not be vulnerable to radiation at high altitudes or to temperature extremes, which can also interfere with signals.

In the intervening months, Chattopadhyay has determined that gallium nitride is the more promising material for the device and plans to switch over to using it exclusively for the MESFET. He hopes to acquire metal organic chemical vapor deposition (MOCVD) equipment to grow the gallium nitride in house, which will diversify research in optoelectronic and electronic devices; gallium nitride is very expensive to buy, and the MOCVD equipment will allow him to control the quality of the wafers at his disposal. He has also modeled the MESFET device and process technology using Synopsys TCAD software, although because the technology is novel and no one has used it before, the modeling has thus far only yielded electrical characteristics, not those of the optical signal.

While he continues to make progress on the SiC/GaN based MESFET, which will be handed over to Boeing at the end of the project for further testing and qualification, Chattopadhyay is already looking ahead to other applications for his technology. These include high-frequency telecommunications and monitoring temperature in jet engines and other extreme environments.

“We believe we’re the first group who are developing such a transistor,” he says, “and this will give us a very wide band of research opportunity.” ❖

## New CECS faculty member is right where he wants to be



**Shahnam Mirzaei**  
Assistant Professor  
Electrical & Computer  
Engineering

For Shahnam Mirzaei, the college's newest faculty member, teaching at his alma mater is like living a dream. It's just taken him a little time to get there.

After earning his bachelor's degree in electrical engineering in his native Iran in 1993, Mirzaei came to CSUN for graduate school, receiving his master's degree in electrical and computer engineering in 1999. Although he always

intended to enter academia, he went on to spend six years in industry because, he explains, he wanted the hands-on experience.

But Mirzaei couldn't stay away for long. In 2003, he began teaching part time at CSUN, in the College of Engineering and Computer Science, while working in industry. In 2005, he returned to graduate school, at UC Santa Barbara, and he earned his doctorate in computer engineering in 2010.

A specialist in digital design, computer architecture, signal processing and reconfigurable hardware, with a focus on image-processing techniques, Mirzaei returned to industry after graduation, working as an R&D engineer for Exelis, which makes ground- and air-based radar systems. But when CSUN posted an opening for an assistant professor of electrical and computer engineering, he followed his heart and applied for the position.

Although he's already familiar with the college and his department, Mirzaei has discovered that a full-time appointment in academia is not the same as part-time work. His new job has been keeping him very busy, teaching an introduction to signal processing and a course in field-programmable gate arrays and preparing to submit proposals, not to mention advising students.

"When you're full time, you have to be really active, going to meetings and getting involved in academic affairs, and writing research proposals," he says. "It's totally different."

But even though he has a little less time for the photography, sports and chess that he enjoys in his spare time, he wouldn't change a thing. "This is what I've been waiting for," he says. "I absolutely love it." ❖

## Faculty: Research and curriculum innovations advance the college's mission

Engaged faculty are effective faculty, and the College of Engineering and Computer Science is endowed with an exceptionally large number who regularly take on innovative research and curricular projects. In addition to indulging faculty members' intellectual curiosity, these projects are advancing knowledge, enhancing teaching and providing opportunities for students to take part in research—a high-impact practice shown to promote persistence to degree.

The following pages highlight some recent CECS faculty projects spanning fields as diverse as biomedical engineering, nanotechnology, renewable energy, computer science, cybersecurity, engineering management, civil engineering, construction and advanced materials. Some are collaborations, while others are the work of the faculty member alone. What all have in common is the benefit they are providing to today's students and the new knowledge they are creating for tomorrow's classrooms and the world students will inherit.

### Aneurysm as a problem in fluid dynamics



Vibhav Durgesh

The study of blood flow, particularly in the brain, is typically the domain of biologists, physiologists, neuroscientists and physicians. But Vibhav Durgesh, assistant professor of mechanical engineering, has recast it as an engineering problem. His novel approach to blood flow inside brain aneurysms won him this year's CECS faculty research fellowship, an annual award that allows a faculty member to spend a semester investigating an idea or pursuing a research project.

"The reason I'm studying this is that blood is a fluid, and I want to quantify the conditions leading to bursting in aneurysms," he says.

An aneurysm is the abnormal ballooning or bulging of the wall of a weakened blood vessel, and it is estimated that 6 million Americans have an unruptured aneurysm. A ruptured aneurysm can be debilitating or fatal, yet corrective surgeries for the condition are high-risk operations.

For his research project, Durgesh will use various glass models to simulate different aneurysms, each filled with fluid that has the same index of refraction as blood. Using a pump system that two of his students are designing, he will make sure the fluid flows much as it does in the human body. With those elements in place, he will make fluid dynamics measurements, using laser Doppler anemometry, to quantify shear stress on the aneurysm wall.

Durgesh's goal for this year is to get the project set up and running so he has the ability to make the measurements. In a later phase he would like to obtain MRIs from patients in order to make exact replicas of aneurysms. Eventually he'd like to test different size stents inside the aneurysm models to determine the optimal design, contacting companies for sponsorships and additional funding.

## Making nanomotors run



George Youssef

When current passes through a wire, it creates a magnetic field, called direct electromagnetic coupling. The stronger the current, the stronger the magnetic field. But reduce things down to the nanoscale, and passing current through a wire won't work as well—most of the current is lost to heat.

With magnetic fields still needed at the nanoscale, researchers at the NSF-funded Center for Translational Applications for Nanoscale Multiferroic Systems (TANMS) found they could

bypass the limitations of direct electromagnetic coupling by pairing a material that produces a magnetic field with one that creates an electrical field through mechanical strain, called "strain-mediated electromagnetic coupling." A collaboration among CSUN, UCLA (where it is housed), UC Berkeley and Cornell University, as well as various research labs and industry partners from around the world, the center is using this technology to focus on three applications—nano motors, nano antennae and nano memory. (*Multiferroic* in the center's name refers to composite materials consisting of piezoelectric and magnetostrictive materials.)

CECS assistant professor of mechanical engineering George Youssef is the center's education director, overseeing the college education program and assisting with precollege education. He is also conducting related research with his students. In one project, he and his team are creating a macroscale physical simulator of multiferroic nanomotors.

"We want to see how coupling these materials will create enough torque to move something, and what the efficiency of the motors is," he says.

In tandem with the simulator, he is working on creating thin-film PZT, a piezoelectric material, and will use a photoelasticity measurement technique to quantify the in-plane strain due to the application of an electrical field on the thin-film PZT.

"We want to know the limits of the strain that can be generated without causing cracks so we'll understand later on how strong the magnetic field will be," he explains.

The impetus behind the TANMS project is miniaturization of electronic devices for biomedical applications. The long-range vision for the center is to create a miniature submarine that can navigate in the bloodstream and go to remote places in the brain, sending information so investigators can better understand why conditions like concussion, for example, happen and how they can be treated.

## Incorporating embedded systems into the curriculum



Ani Nahapetian

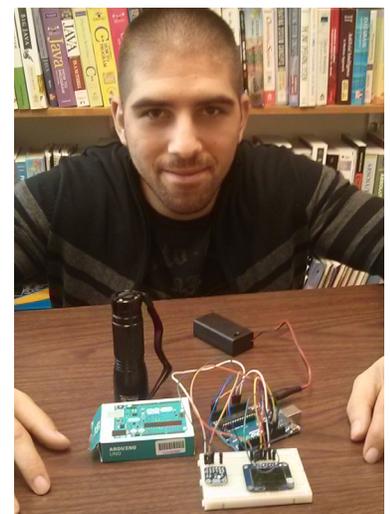
Whether you know it or not, embedded systems are everywhere in our environment, from the controllers in washing machines and on-board computers in cars to mobile phones and tablets, to name just a few examples. And now that they are becoming ubiquitous, the need is growing rapidly for professionals trained in the technology.

"There is data showing how many embedded processors are being sold versus general

purpose processors, and the number is exponentially higher for embedded processors," explains Ani Nahapetian, assistant professor of computer science. "It's an area where there is growth commercially, but there will also be a need for trained students to work in that area."

A recent grant from Intel Embedded will help CECS produce graduates with expertise in the field. The grant, which includes a cash award as well as ten Intel Atom cores, grew out of a research and education conference Nahapetian attended for Intel and its academic partners, where she submitted a white paper and had many conversations with their staff. It is designed to provide the resources for students and Nahapetian to develop interesting embedded computing activities over the course of a year that can then make their way into the classroom and eventually into student research projects. Fortuitously, it coincides with the debut of a graduate-level mobile computing course, which Nahapetian designed and is teaching, and plans call for incorporating the Atom technology into the course the next time it is offered. (One student isn't waiting, however, and has already begun working on a project with the Atom processor.)

"There are a lot of resources on campus, and the best resource is our students, who are quite capable and very open to learning," she says. "If there are interesting projects in cutting-edge areas, it's a win-win for everybody. Students learn and make connections and hopefully get hired, but CSUN also wins, and industry wins because they get our output in the form of research products and well-trained students. And we all plan to grow this interaction and leverage it for future students."



Arsen Papisyan MS student in the computer science department

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## A collaborative approach to conduct non-destructive testing



Rais Ahmad

Over the past ten years, burst water and gas lines have been responsible for some \$200 million in damage, and when they break, they are out of commission for a long time. Current techniques for inspecting pipes for damage—the very process that could minimize such accidents by identifying problems before they become manifest—require the shutdown of the entire distribution system for hours or even days, which is a costly proposition. It was recently estimated, for example, that shutting down the water distribution system in Arizona costs about \$4 million an hour.

Non-destructive testing aims to develop techniques that can inspect the condition of critical pipelines and other infrastructure without hampering the delivery system. Rais Ahmad, an assistant professor of civil engineering and construction management and an expert in non-destructive testing, has recently embarked on a collaboration with Aerojet Rocketdyne's non-destructive testing unit to develop a technique for finding defective pipes using guided acoustic waves.

"What we do is generate a signal and observe it from the other end of the pipe," says Ahmad. "Once we receive the signal, we process it with some mathematical tools and try to identify whether there is any problem or defect in the pipe and if so, where it is."

While Ahmad has been investigating the potential of guided waves to detect problems in underground pipes for some time, the Rocketdyne project is allowing him access to more sophisticated facilities than those available to him on campus and is helping to expand the application of his work beyond pipes to other structures. Currently he and his Aerojet Rocketdyne colleague, Steve James, are developing the testing instrumentation, and when their work is further along, they hope to interest oil companies in partnering with them as well.

They also have a second project queued up—a modeling approach to acoustic wave propagation generated by phased array transducers. The system is based on what Aerojet Rocketdyne has used to inspect welding, but Ahmad and James's emphasis will be on modeling welding for different joints. They expect to start a design clinic for this project, with a student working in both Aerojet Rocketdyne's lab and Ahmad's lab.

For Ahmad, the Aerojet Rocketdyne collaboration is an ideal jumping-off point to forge collaborations with other companies, perhaps in other aspects of non-destructive testing, such as material characterization. "You can apply NDT to lots of areas," he says.

## Cybersecurity research stays one step ahead of technology



Adam Kaplan

All over the world, power companies have installed millions of smart meters, which enable two-way communication between the meter and the utility's central system. Because smart meters gather data for remote reporting, in time, they will almost certainly be able to talk to any smart device. It's this very capability that is both tantalizing and disconcerting. While it could be useful to know how much energy your TV, refrigerator or laundry appliances are consuming, for example, or to turn your lights or air conditioning on and off using a cell phone, the system may also

prove vulnerable to malicious attacks. And that's where Adam Kaplan's research comes in.

Kaplan, an assistant professor of computer science, has developed a research project that seeks to determine whether smart meters are susceptible to hacking and if so, what kinds of information a hacker might be able to obtain.

"Smart meters themselves are running on a wifi-like interface," he says. "Smart meters use a slightly different standard than the one we know, but it is still quite hackable and 'sniffable.'"

Kaplan intends to find out if it is more hackable and sniffable than the wifi standard, using a radio device to sniff networks and see what is being broadcast unencrypted, as well as to find out what is being sent encrypted, what it takes to crack the encryption, what computer resources are needed to hack the system quickly, what information is gained from cracking that encryption and what damage potentially might be done.

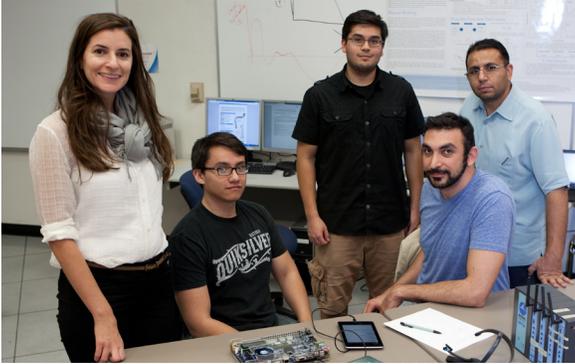
"There are attacks that could cost consumers money," he speculates. "Maybe utility use could increase significantly through devices that people are not aware of. Or maybe billing information is sent, and a hacker could get credit card numbers for billing. An attack could be physically damaging, such as disabling the air conditioning on a very hot day or turning off the refrigerator. It could have repercussions beyond simply annoying or financial."

Kaplan's goal for the research is to come up with a guide of best practices in smart meter security for savvy consumers. Just as there are established best practices to secure laptops, mobile devices or home networks against most major vulnerabilities and attacks, he wants to provide something similar for smart meter interfaces.

"This technology will be increasingly important to the home network," he says, "and we need to know what we are opening ourselves up to four, six or ten years from now when it is widely adopted."

## Ideas are being born in new Bioengineering Research Incubator

The college's brand-new Bioengineering Research incubator is a testament to what can happen when vision, collaboration, determination and resources come together. The interdisciplinary facility, which was established this academic year with internal CSUN funding and space allocated by CECS, is the brainchild of assistant professors Ani Nahapetian (computer science) and George Youssef (mechanical engineering), who conceived the idea and are its codirectors.



Ani Nahapetian, far left, and George Youssef, far right, flank mechanical engineering graduate students Andres Chavez and Carlos Medina and computer science student Bardia Keyvani.

“It’s a way of accommodating students who are interested in bioengineering while pursuing related majors,” explains Nahapetian. “We wanted to pull them together into an incubator space where ideas come out of collaboration, conversations and trying to engineer solutions from software and hardware. With these interactions, students and faculty advisors will work on new and interesting solutions to bioengineering research problems. The goal is to have students take the work to publication and maybe commercialize it as well.”

The incubator space is a development environment, outfitted with a number of computational devices, an ECG, pulse oximeter, pressure sensors, heart rate monitors, sensor-actuator devices, and a Sphero Ball that can be programmed for functionality. Before they can be part of the incubator, however, students must have a faculty advisor and a project that has been fully fleshed out. The projects are not part of any course, and the facility is not limited to CECS students—it is open to anyone on campus who wants to take part and meets the criteria.

“We’ve aimed to have people with various areas of expertise on campus come together in the incubator, so the interdisciplinary aspect of the collaboration leads to better solutions to bioengineering problems,” Nahapetian says.

Already a dozen students, both graduate and undergraduate, are taking advantage of the facility. For many it is a training ground, while others are using it to work on research related to their master’s theses.

Nahapetian and Youssef hope to use the incubator as a launching pad for other projects. The long-term goal is to train students to enter the bioengineering workforce and increase their exposure to local, international and national companies.

For more information about the Bioengineering Research Incubator, see <http://www.ecs.csun.edu/incubator/index.html>.

## Joint research project spans countries, cultures



Jimmy Gandhi

Collaboration is ingrained in the culture of the College of Engineering and Computer Science, and that tradition has recently gained added momentum through S. Jimmy Gandhi’s work. Gandhi, an assistant professor of engineering management who specializes in quality management, already collaborates with several local companies in the San Fernando Valley and with industry professionals to continuously improve the course material he teaches. But most recently, he has teamed up with Manipal University in India, working with colleagues in its engineering program, Manipal Institute of Technology, to conduct joint research.

“It’s the largest private university in India, with about 28,000 students, and it’s situated in the southern part of India in a town called Manipal, which is a few hours from Bangalore,” he explains. “It originally started as a medical college, but it has a fantastic engineering program.”

The two universities signed a memorandum of understanding in fall 2012, and Gandhi has met with his Indian colleagues twice since then. They are currently doing research in supply chain management, engineering education, innovation and risk management—a collaboration that includes working on joint publications. They are also considering writing joint proposals in the area of sustainability. Future collaborations with Manipal University include developing a curriculum for educating engineers in entrepreneurship.

As far as he’s concerned, this collaboration is just the beginning, however. Because of the global nature of manufacturing and services, he is eager to expand the partnership to other universities, perhaps in China and Europe, and to involve other CSUN colleagues as well.

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## Smart grid trainer offers a glimpse of our energy future



Kourosh Sedghisigarchi

It's a hot, humid summer day, and the spiking demand for air conditioning causes a blackout. With current technology, the power grid will remain down until the problem is fixed. Jump a number of years into the future, however, when the so-called smart grid is fully implemented, and solar panels or wind turbines that have been programmed to operate autonomously will help keep critical loads within a neighborhood or campus alive. Better yet, the whole system will be programmed to redistribute the load and prevent the blackout in the first place.

The smart grid uses new technology such as smart meters, controllers and devices that can communicate to optimize power conservation and delivery. It also promotes integration of renewable energy resources and promises to increase the efficiency of today's system by approximately 9% by 2030, saving more than 400 billion kilowatt-hours each year—an estimated \$42 billion in the first year alone.

Because it is the wave of the future, Kourosh Sedghisigarchi, assistant professor of electrical engineering, is eager to establish a smart grid laboratory at CSUN. As a first step, he has been building a smart grid trainer in his lab, courtesy of funding from a campus grant and help from a team of student volunteers. The trainer will work with the existing renewable energy station already installed on the engineering building, which includes four photovoltaic panels and a wind turbine with a total maximum output of 1.6 kW. The output of these devices will be hooked up to the trainer, allowing users to demonstrate various features that the future smart grid will have.

“This is not a simulation but a hardware bench that mimics a small, low-voltage electric power system,” Sedghisigarchi says. “We can hook up data acquisition devices to monitor the voltage and current at every node of system. We can add on real digital protection devices to keep the system safe, reliable and robust. Also, demand control can be remotely accessed via cell phone or any laptop.”

The beauty of the system he adds, is that it can be used for teaching as well as for research. His hope is that students who gain experience with these technologies will find many job opportunities. And he notes, “It will also bring opportunities for industry and utilities to collaborate with us.”



From left: Kyle Abrahamsen, Paul Jessen, Kourosh Sedghisigarchi, Steven Sanchez, Vaheh Elyasi and Edith Elyasi

## Advanced Materials Lab conducts advanced research



Behzad Bavarian

Mix together one part biosensors, one part batteries and one part anticorrosive coatings, and what do you get? The college's W.M. Keck Foundation Advanced Materials Lab.

For 18 years, the lab, under the direction of manufacturing systems engineering and management professor Behzad Bavarian, has been a hub of cutting-edge research in CECS, supported by the Keck Foundation, Easton Foundation, Department of Defense and NASA, among others. Currently it is focused

on three projects—the aforementioned biosensors, batteries and anticorrosive coatings.

A couple of years ago, with funding from Medtronics and the university, Bavarian began investigating several protective polymer coatings for biosensors that would be implanted under the skin. The challenge was to find a material that would survive three months in the human body, which is a very unforgiving environment for foreign substances. Two of the coatings have now emerged as frontrunners, able to last 180 to 200 days of exposure.

The lab is also in the second year of a collaboration with a local company that has received National Science Foundation funding to explore the feasibility of creating metal ion batteries as an alternative to more expensive lithium ion batteries. Bavarian and his collaborators are focused on the potential of sodium and magnesium, two elements that are plentiful in the environment, and are hoping to develop batteries that are smaller and more efficient than those that are currently available. The project has attracted the interest of the Department of Defense, which wants to find alternatives to equip soldiers in the field, as well as the Department of Energy, which is looking for new energy storage solutions.

For five or six years, the lab has been working with the Cortec Corporation, to help develop a product that can be painted onto the surface of concrete and will penetrate deep inside to protect rebar against corrosion. The lab is compiling the data and has determined that it takes about 120 days to migrate into the structure and coat the rebar. The construction industry is also looking for long-term data, so Cortec wants to ascertain how long the coating will stay in place on the rebar. In addition, the lab has made suggestions to improve Cortec's original formulation.

“The reason we selected these projects is because they require so much data acquisition, and it's good practice for undergraduate students to get involved in the testing to learn how to conduct an experiment and be part of a team and communicate data,” Bavarian says. “This is promoting undergraduate research by motivating students to get involved in the earliest stage and contributing to these critical needs. It's important to deliver results, but the bottom line is education and producing engineers who can begin to solve some of these critical needs.” ❖

# Spectral Lines: CSUN Shines

## Ramesh elected to ABET board of directors



Dean Ramesh

CECS's dean, S. K. Ramesh, now has another title (and responsibility): member of the board of directors of the Accreditation Board for Engineering and Technology, better known as ABET. ABET is the organization that accredits over 3,100 postsecondary education programs in applied science, computing, engineering and engineering technology at more than 670 colleges and universities in 24 countries. Its membership is made up of 33 different professional societies that serve the fields it oversees; each society is allocated board representation based on the number of accredited programs

in its field. The largest is the IEEE, and when one of IEEE's existing representatives was appointed secretary of the board, he could no longer represent the IEEE as a board member, so a special election was called. Ramesh was nominated for his seat and elected July 1 to the board.

The ABET board essentially functions as the executive arm of the organization, responsible for setting accreditation policy. Ramesh notes that one of the key things its members are currently grappling with is the changing educational landscape, which not only includes growing numbers of international programs but online degree programs as well.

"These are issues that are floating around, and they represent both an opportunity and a challenge for us," he says.

Ramesh will have two years to provide his insights on these and many other matters that come up. If the IEEE then reelects him to represent the society on the board, he will be eligible to serve up to two more consecutive terms of three years each, for a total of eight years.

Although he regrets that his position as a board member now precludes his serving as a program evaluator for ABET, he says, "It's a different calling at this time, and I'm really looking forward to it because there's so much to learn from ABET. Plus it's a chance to shape policy, working with other members of the board, other societies, other disciplines. It's going to be a lot of work, but it's a great opportunity." ❖

## Students posting solid gains from AIMS<sup>2</sup> grant

Two years after the CSUN College of Engineering and Computer Science was awarded the largest grant in its history—a five-year, \$5.5 million U.S. Department of Education HSI-STEM grant—the program, called Attract, Inspire, Mentor and Support Students (AIMS<sup>2</sup>), is continuing its impressive momentum and showing unambiguous signs of success.

AIMS<sup>2</sup>, a collaboration between CSUN and two feeder community colleges, College of the Canyons and Glendale Community College, is designed to increase the number of low-income, Hispanic and other underrepresented students graduating from CSUN with engineering and computer science degrees. Students in the program, half from CSUN and half from the community colleges, have access to special faculty mentoring and advisement, tutoring and peer mentoring, social activities, field trips and summer research opportunities.

Now entering its third year, AIMS<sup>2</sup> has placed iPads in the hands of all participating students and faculty, who are using them to good effect in their classes. Last summer, students in the program again took part in research in CSUN labs, and some are now beginning to transfer into CECS from the community colleges.

Perhaps most significant, however, are the program's metrics. Recently, for example, the Hispanic Association of Colleges and Universities

(HACU) announced 20 scholarships nationally, and two of those went to students in CSUN's AIMS<sup>2</sup> cohort. And overall, the program is responsible for a huge improvement in persistence—defined as continuing enrollment from one semester to the next. For cohort 1, the persistence rate at the end of year 1 was 96.7%, while a comparison group's was 78.7%. For cohort 2 the persistence rate was 100%, compared to the comparison group's persistence rate of 90.8%. Students in the AIMS<sup>2</sup> cohorts are also earning better grades while enrolling in more classes compared to their peers. Persistence is widely considered the key to increasing graduation rates in STEM fields.

"We're about midway through the grant, and the students seem to be doing really well," says S. K. Ramesh, CECS dean and principal investigator on the grant.

Moving forward, Ramesh intends to focus some energy on ensuring the AIMS<sup>2</sup> students good jobs in industry after they graduate by leveraging the college's industry partnerships. He hopes companies with a stake in its success will also help sustain the program after the grant funding runs out in 2016.

By then, he may have some help from alumni of the program. At one of the program's social events, several students who took part in summer research projects said, "When I graduate and find a job, I want to come back and support this program." ❖



# Conferences

## CECS alum talk is highlight of CSUPERB 25th Biotechnology Symposium

On the surface, the annual CSUPERB Biotechnology Symposium may not be the likeliest place to find alumni of the CSUN College of Engineering and Computer Science. The systemwide program is devoted to developing the professional biotechnology workforce, and its annual symposium is designed to broaden exposure to cutting-edge biotechnologies, product-focused innovation and career paths in the life sciences.



CECS alumnus Milad Girgis (BS '97; MS '01)

But last January, for the symposium's silver anniversary, CECS alumnus Milad Girgis (BS '97; MS '01), who earned his undergraduate degree in mechanical engineering, was one of the featured speakers, and it was a perfect fit. His talk, titled "From Machine Design and Internal Combustion Engines to Deep Brain Stimulation," underscored the value of the education he received at CSUN, tracing how a foundational education in the principles of engineering was transferable to a career in medical devices.

"When I entered the university back in 1991, even though we were coming off an economic crisis and stock market crash, people were saying I was crazy for getting into engineering," says Girgis,

vice president of international sales, program management and deep brain stimulation at Boston Scientific Neuromodulation. "But I followed my passions and did some amazing things like working on the Formula SAE car. I talked about the lessons I learned from CSUN—things like scheduling a fixed-end project and how to get things done and work with a diverse team of engineers."

He also discussed the career potential in the medical device field and the fact that a background in biology, chemistry or biomedical engineering isn't necessarily required to design the products because the same foundational principles of science and leadership apply across disciplines.

As a speaker at the CSUPERB Symposium, Girgis was in fine company. One speaker was a cancer researcher, another had discovered a molecule, and yet another was working for a diagnostics company, developing machines for hospitals. But it was clear that Girgis's message had special impact. One student responding to the post-symposium survey wrote that he or she would remember, "... the inspirational speakers on Friday morning that came from CSU schools and succeeded in their educational career or their work career. Especially the engineer's talk!" ❖

## Art of Innovation conference breaks new ground



It was an ideal match: the In2:InThinking Network paired with the college's Ernie Schaeffer Center for Innovation & Entrepreneurship and Department of Manufacturing Systems Engineering and Management (MSEM) for a one-day conference on innovation.

The Art of Innovation conference was conceived last year, when Ileana Costea, chair of the MSEM department, attended the 2012 In2:InThinking annual forum. In2:In Thinking is a nonprofit organization that brings together people who share an interest in using better thinking to create a better future.

"They were talking about various aspects of problem solving but really thinking out of the box, which I liked," she says. She suggested to the group's president, Bill Bellows of Aerojet Rocketdyne, that CSUN host a small one-day conference on innovation and entrepreneurship in conjunction with the 2013 In2:In Thinking Forum, and that both events be held on campus. The two events would collaborate on space and advertising and share resources. The conference provided an excellent platform for the Schaeffer Center, and CSUN was a perfect location for the In2:In Thinking Forum, so the plan was put into motion.

Costea and Mark Rajai, assistant professor of MSEM and director of the Schaeffer Center, co-chaired the inaugural Art of Innovation conference; Shereazad "Jimmy" Gandhi, assistant professor of MSEM, became its program chair. The event they planned featured two keynote speakers, CSUN alumnus Dale S. Deardorff, founding director of innovation and strategic thinking at the Rocky Peak Leadership

Center, whose talk was titled "Structured Innovation Systems," and Matt Keennon, senior scientist at AeroVironment, Inc., who spoke on "Turning Giant Dreams into Tiny Realities: Building the Micro Flying Machines of Tomorrow." In addition, graduate students were invited to present projects. Topics ranged from innovation in construction management to K-12 pedagogy, from tinnitus to automotive braking systems, as well as green innovations at the San Pedro port.

The conference, which took place June 21, surpassed attendance projections and attracted participants from as far away as New York. Students and faculty made connections leading to research collaborations, and attendees also mingled with the In2:In Thinking Forum attendees. The event even turned a small profit, which is highly unusual in a climate where most conferences struggle to break even.

"It was a huge success," Rajai says. "We hope to make this a national and international event."

Plans are under way to repeat the conference next June, with an emphasis on expanding participation from groups representing more diverse industries, locations and fields of study.

"We want to make an annual meeting a tradition, which should stimulate innovation," says Costea. ❖



## California Renewable Energy and Storage Technology Conference powers ahead

Word is getting out about the California Renewable Energy and Storage Technology (CREST) Conference, even though it's only two years old. At the 2013 conference, held May 4, both attendance and the number of sessions offered were up over last year.

"We're happy with how it's progressing, and there is excitement on campus," says Abhijit Mukherjee, assistant professor of mechanical engineering, who organized the event. "Expectations are high, and it's hard to keep pace. We're trying to involve more faculty so it becomes bigger and even more successful."

This past year, 80 people attended, up from 64 the year before, and Digital Energy came forward as a sponsor. Highlights included a talk by Rajit Gadh, director of UCLA's Center for Smart Grid Research Center; a luncheon keynote address by David Nahai, former Los Angeles Department of Water and Power CEO and general manager; and the afternoon session, presented by industry professionals and organized by the Los Angeles Cleantech Incubator, which recently set up a satellite office on campus.

"Students could see careers and applications in front of their eyes and learn where industry stands and where they can find jobs when they graduate," Mukherjee says. "They could connect with people from industry, and that motivated them. Most who attended were very excited."

Looking ahead, Mukherjee hopes to attract more sponsors and attendees to help grow the program. It's all for the benefit of CSUN, he says, offering visibility for the university and faculty and facilitating connections between academia and industry. ❖



## Assistive technology goes international...again

It's been 28 years since the first International Technology and Persons with Disabilities Conference (or CSUN Conference, as it is informally known). Since then the annual gathering has become the largest and best-known conference of its kind; it has also begun spawning spinoffs abroad. In 2012, for example, C.T. Lin, professor of mechanical engineering, and CECS dean S.K. Ramesh traveled to Linz, Austria, for the International Conference on Computers Helping People with Special Needs (ICCHP), which was inspired by the CSUN Conference and has been running every two years for approximately a decade.

Because of the college's leadership in assistive technology engineering, Ramesh and Lin have become sought-after speakers in the field. Last summer, they were invited to a new conference in India: Intelligent Interactive Systems and Assistive Technologies (IISAT), cosponsored by the IEEE, CSUN and the Kumaraguru College of Technology (KCT). Held August 1 through 3 at KCT, it brought together approximately 100 researchers, students, developers, engineers, managers and decision makers from government, academia and industry to share the latest advances in intelligent systems and automation, controls and communications technologies, with an eye toward applying them to help people with special needs.

Lin and Ramesh gave a half-day workshop on the programs at CSUN, with Lin attending virtually from Northridge. "When they teach engineering in India, they think very traditionally—mechanical engineering, electrical engineering, civil engineering," says Ramesh. "This conference opened up a whole set of possibilities—how you can use your engineering degree to help people."



Dean Ramesh with conference keynote speakers and organizers.

The conference also included the first-ever SS12 competition in Asia, which attracted approximately a dozen student teams from universities in India, Bangladesh, Pakistan, Sri Lanka, Japan and Australia, competing to develop software applications to serve people with disabilities. Modeled after the SS12 events in the U.S. and Europe, it was sponsored by Project Possibility, as the U.S. and European SS12 competitions are.

The IISAT conference was such a success that KCT has committed to build a center on its campus to promote assistive technology.

"The whole field is very nascent in India," Ramesh explains. "It doesn't exist. But there are a lot of people who need assistive technology, and KCT will be taking the lead."

As further evidence of CSUN's growing international influence in assistive technology, two faculty members from Korea Nazarene University (KNU) visited the university in July, along with 15 leaders in the field of rehabilitation in Korea and a councilwoman from the city of Cheonan. KNU specializes in assistive technology and rehabilitation engineering and was interested in exploring ways to strengthen the partnership between the two institutions, including opportunities to send KNU students to CSUN. A visiting KNU faculty member, Dr. Juhye Yook, was on campus for most of the year as well, working with Ben Mallard, professor of electrical and computer engineering, on augmentative and alternative communication. ❖



From left, Dean Ramesh, Juhye Yook, Mary Ann Cummins-Prager, and KNU president Min Gyoo Shin.

# Students

## Smart parking means parking smart

It's a pervasive dilemma of modern urban society: how to determine the number of empty spaces available in parking lots for popular destinations, like malls, movie theaters and, well, CSUN.

Current solutions include sensors or cameras that track how many spaces are occupied, coupled with digital signs at parking lot entrances that indicate the number of free spaces. So far, these installations offer varying degrees of accuracy, and with so many sensors to install and hook up, large-scale systems are expensive.

Last year, a couple of CECS students, Norvan Gorgi and Mazyar Aram, came up with a different, more cost-effective idea: rather than tracking the status of each parking space, why not track the number of cars entering and exiting the lots to tally the total at any given time, which would be far cheaper than existing solutions? The need was so great and their concept so promising that they received CSUN funding to implement their idea in parking structure B5 as a proof-of-concept study. After the university's Physical Plant Management drilled four holes in the pavement at the lot's entrances and exits to accommodate sensors, the team installed the sensors, which communicate to a central device to track the comings and goings of the cars. Gorgi and Aram developed a basic interface and spent last spring and summer demonstrating that their system works.

Their success has led to renewed funding for the 2013-14 academic year, which is enabling them to implement the second phase of the project—expanding to two additional parking structures and creating a Web-based



From left, students Norvan Gorgi and Max Aram with professor Adam Kaplan working on the smart parking design. At right: construction in Lot B5

service and mobile applications for Android and iOS that will interact with the system and provide users with the occupancy of the lot at any given time.

“The attractive piece of this project is that we might be able to give the same information much cheaper than most of the competition and also provide the availability of parking online as opposed to at the entrance of the lot,” says Adam Kaplan, assistant professor of computer science, who is serving as the project's technology faculty advisor. “We may also be able to trace the history of the demand for parking, using a graph, for instance, to show the trends on a day-to-day basis, which would be valuable to campus police, who have to direct traffic for special events, and for students and visitors. I can't see anyone losing.”

As it evolves, the app may be incorporated into the CSUN mobile app that debuted this year. And looking ahead, Kaplan says, it could morph into a real business. For now, though, the team is focused on developing the system into an application with utility for anyone who drives to CSUN. ❖

## Refurbished machine shop gives students hands-on skills

George Youssef, an assistant professor of mechanical engineering, was walking past the college's aging machine shop last year, when an idea he'd been mulling over crystallized in his head. Why not upgrade the shop to teach engineers machining? Youssef, who teaches machine design, had found that when students arrived in his class, they couldn't readily translate the designs they created in CAD to real life. Giving them hands-on machining skills would help them understand the capabilities and limitations of the machines, so when they put their ideas on paper, they would be able to gauge whether or not they were feasible.

He shared his idea with associate professor of mechanical engineering Robert Ryan, who was equally enthusiastic, and the two submitted a proposal for university funds to refurbish the machine shop and engage students through a series of workshops. They received the grant, and it soon became a collaboration that extended far beyond the pair. Department chair Hamid Johari agreed to let the department manage the funds, relieving Youssef and Ryan of that time-consuming burden. To stretch the money to the maximum, Stewart Prince, professor of mechanical engineering, donated two old machines from his lab. Through the intervention of Dean S. K. Ramesh, the college was able to obtain new equipment at cost from Ganesh Machinery, a company owned by an alumnus



At the machine shop are students Kari Kellams (top) and Curtis Gordon and Michael Villa (below, from left)

of CECS. Emil Henry, the college's manager of technical services, helped reorganize and upgrade the machine shop, as well as plan the workshops with Youssef and Ryan.

With the machine shop now refurbished, the team rolled out a three-day machining workshop in which students fabricate a C-clamp. Participants first learn about safety, and machinist Roger Arias demonstrates the machines and oversees the workshops. The students go on to make the parts for the clamp, and at the end of the workshop, they take an online quiz; if they pass, they receive a certificate of completion that allows them to use the shop.

“The fun part is that we can't keep them away,” Youssef says. “We were thinking we were only going to train 50 students, but the first year we had 87. And just by having the machine shop, between the workshop and projects, students stayed on campus an additional 2,000 hours in the 2012-13 academic year.”

The team received the grant again for the current year, so the workshops will continue, and Youssef estimates that they will train 100 students in 2013-14. For the long term, however, he is interested in identifying additional sources of funding that will enable the college to continue offering the workshops and producing graduates who have hands-on experience with machining, which will enhance their engineering expertise and job prospects. ❖

## CECS students mentor, inspire middle school students through robotics

There were robots upon robots at CSUN last summer, when students from three Valley middle schools met up with members of the CSUN Matabots, the university's cross-disciplinary VEX robotics club.

It all started during a regular meeting of the robotics club, when Dale Conner, the club's advisor, and Mike Rivas, a representative of CSUN's Summer Academic Enrichment Program, came in to say that Project GRAD Los Angeles, a nonprofit dedicated to working with students and families to promote college success, was looking for people to teach robotics to middle school students. A few days later, a Project GRAD representative met with club members and briefed them on the program and its goals.

From there, the CSUN Matabots, consisting of computer engineering, mechanical engineering and accounting majors, put together a lesson plan for the program; they also created a game that would put the robots through their paces, yet be simple enough so that the middle school students could build competitive robots and have fun in the process.

"We were pretty excited to teach them," says Edwyn Jocol, the club's secretary and a computer engineering major.

During the summer two cohorts of 30 Project GRAD students went through the two-week program. The first week, they learned basic



Competition day for the first group of Project GRAD students, with the CSUN Matabots

principles of robotics and design, and during the second, teams of five students built robots from VEX kits.

"Some of their designs were pretty creative," Jocol says. "Through the kids we discovered different ways to use some of the parts that we honestly hadn't imagined. They used some of the parts in a unique way."

The last day of the program, the teams competed against one another in the game the CSUN students had devised. Afterward, some of the students reported to Project GRAD staff that they were considering careers in engineering.

Now that the VEX club members have some focused mentoring and teaching under their belts, they may be on the verge of expanding their outreach. Six schools are interested in having the CSUN students mentor their students.

"Aside from having a passion for robots, we also like to give back to the community," Jocol says. ❖

## Young Engineers Day opens doors and minds

More than 100 middle and high school students converged on CSUN last spring to spend a day exploring different facets of engineering. Organized by the campus chapters of the American Society of Mechanical Engineers (ASME), Society of Hispanic Professional Engineers (SHPE), Society of Automotive Engineers (SAE) and Tau Beta Pi (engineering honor society), Young Engineers Day featured several hands-on activities designed to engage the younger students and demonstrate how engineers think and what they do. Between 20 and 30 CSUN students volunteered for the day, becoming role models as well as facilitators.

ASME served as overall coordinator for the event, which took place April 5, and enlisted the help of the other organizations, each of which presented a workshop. ASME's required students to use gears to move a track system from left to right based on how the gears were set up. SHPE had students perform an experiment with circuits. SAE staged a miniature soap box derby, giving the participants materials and having them design cars that then raced down a ramp. Tau Beta Pi had students use pennies to create a magnetic pulse that moved a needle. As they walked

from workshop to workshop, the participating students, who came from Luther Burbank Middle School and San Fernando High School, had an opportunity to tour the engineering labs.

"The idea was to try to show students who weren't into engineering what it's about—to explain what engineers do and how the industry works," says Siv Natarajan, president of ASME at the time of the event. "It got them motivated."

By all accounts, the event achieved its objectives. Several of the students were so intrigued by the activities that they took an extra half-hour to finish an experiment and were late to lunch. At the end of the day, many of the students were overheard talking about how much they enjoyed the day because they hadn't been exposed to engineering before.

Young Engineers Day was supported through an allocation from the Associated Students and a Diversity Action Grant from ASME's national organization, and if past experience is any indication, it was an excellent investment. In previous years, a number of students who attended the workshops decided to go into engineering because it gave them new insights into career opportunities and helped them decide what they wanted to do with their lives. ❖



# STUDENT COMPETITIONS



## CECS teams were the ones to beat at student competitions

### AeroDef Manufacturing Challenge



In the 26-year history of the AeroDef Manufacturing Challenge (formerly WestTech), it had never been done: a clean sweep of the competition's three top categories by a single university. But on March 18, 2013, CSUN did the near-impossible, claiming the grand prize, first place in the University division and the William B. Johnson "Leadership in Manufacturing" Award, which went to James Hunter.

The college entered two teams in the competition, which is sponsored by the Society of Manufacturing Engineers, and both were coached by Mark Rajai, assistant professor of manufacturing systems engineering and management, who set his sights on the grand prize—something CSUN had never won before.

"I challenged them," he says. "I told them I'm not concerned about other universities. You're going to be the best. I'm concerned which of you two teams will win the grand prize."

A total of 23 colleges and universities competed in the event, and each team was required to do a 15-minute poster presentation in front of a panel of five judges from industry, display its product and submit a report. One of the innovations Rajai introduced this year was a three-minute video for each presentation, which he felt was key to their success. One CSUN team presented an automated lifting system designed for automotive hobbyists and small automotive repair shops and the other an assisted gripping rig for people with limited strength in their hands. The assisted gripping rig won the grand prize, and the automated lifting system won first place in the University division. James Hunter, recipient of the William B. Johnson "Leadership in Manufacturing" Award, had been nominated by faculty and was a member of the automated lifting system team.

"Personally, I believe this is one of the best groups I've ever seen," says Ileana Costea, chair of the Department of Manufacturing Systems Engineering and Management. "They were extremely motivated and made it work for themselves. I also think the instructor pushed them to do a lot of research and put a very strong emphasis on documentation and presentation."

The automated gripping system also fared well on the homefront, claiming the top prize in the 2013 Senior Design Project Showcase in April (see page 24). ❖



1



3



2



4

1 and 2: Grand Prize winner, the Assisted Gripping Rig team. Top picture from left, Tawsive Ibrahim, Khaled Alturkey, Jobinderjit Kaur, Hovig Keushkerian. Not pictured are Colin Irwin and Aaron Michelson.

Background image: Assisted Gripping Rig team making their presentation.

3. James Hunter, recipient of the William B. Johnson "Leadership in Manufacturing" Award

4. First Prize winner, the Automated Jack Lift System team. From left, James Hunter, Jordan Stawarz, Kevin Manocheri, Arin Clint, Ivan Escobar, and (not pictured) Ayzdhan Salim

# Intelligent Ground Vehicle Competition



The Scorpion team from left, first row: Chris Do, Ali Ghazal, Chase Warmuth, Daniel Kim, Tynan Kelly, Brionna Stearns, Brian Bati, Merquisedet Absalon; second row: Jeffery Ferree, Brian Burrows, Daniel Franco, Zexian Li, Derek Dreblow, Diego Castillo, Andres Lopez, Richard Walker, Hovhannes Mikhtaryan, Sasan Akhavan, Prof. C.T. Lin; third row: Freddie Ayala, Abou-Baker Kadmiry, Hugo Anderson, and Heros Nasiri

CSUN continued to excel at the Intelligent Ground Vehicle competition, sponsored by the Association for Unmanned Vehicle Systems International (AUVSI) and the U.S. Army's Tank Automotive Research, Development and Engineering Center (TARDEC). The competition requires teams to design and build an autonomous ground vehicle, then put it through its paces in a series of challenges. CSUN's vehicle, Scorpion, tied for second place overall and came in first in the autonomous navigation (auto-nav) portion of the contest, which was held June 7-10 at Oakland University in Rochester, MI.

"The auto-nav challenge is the most difficult one, and it's the most spectacular, so that win was more exciting to us," says C.T. Lin, professor of mechanical engineering, who advised the cross-disciplinary 24-member team. "People always watch the vehicles navigating, and it captured a lot of attention."

For the next IGV competition, this year's CSUN team is designing a brand-new platform, which will be very lightweight and feature a low profile. Its members hope that the new vehicle will repeat the successes of previous years and bring home yet another trophy to Northridge. ❖



The CSUN autonomous ground vehicle, Scorpion, turning in the rain at the AUVSI competition.

## SS12 Code for a Cause

What started as a project for a student competition has ended up as an Android mobile app available through the Google Play store, thanks to the success of five CSUN computer science students. The students, who were initially coached by tutorial coordinator Doris Chaney and later by assistant professor of computer science Adam Kaplan, entered the SS12 Code for a Cause competition, sponsored by Project Possibility, a nonprofit organization dedicated to creating open source software for people with disabilities.



The Audio Alert System team, from left, Matthew Newbill, Kyeong Hoon Jung, Ismael Gonzalez, Chris Cederstrom, and Joshua Licudo.

After prevailing at the local CSUN competition, where they had just 21 hours over two days to meet, plan, develop the app and build it, they went on to the national competition at CSUN's 28th Annual International Technology and Persons with Disabilities Conference in San Diego. There they competed against teams from UCLA and USC, and once again they came out on top.

The winning app is called the Audio Alert System and is designed for hearing-impaired users. It runs in the background using a cell phone's microphone to detect whether an emergency event is happening near the phone. If it detects a fire alarm or a siren, for example, it can give haptic feedback to the user by vibrating and flashing colors on the screen. It can also notify other devices or people on a user's contact list. The app is being heavily downloaded on the Google Play store, and the team is continuing to develop it by adding new features.

If you are interested in participating as a judge or mentor for future CSUN teams, please contact Doris Chaney at [doris.chaney@csun.edu](mailto:doris.chaney@csun.edu). ❖

# STUDENT COMPETITIONS



Right, the build team for the bridge staged and waiting for their turn to construct. From left, students Theodore Boehm, David Pineda, Moe Elias, Dane Beaudette, and Eric Sotto. Left, the CSUN build team in action at the ASCE competition, with teams from other universities looking on.



## Steel Bridge

CSUN's Steel Bridge team upheld a long, proud campus tradition by qualifying for the national competition for the 11th time in 15 years. The competition, sponsored by the American Society of Civil Engineers, requires teams to design, fabricate and build a scaled steel bridge in response to a mock request for proposal. The bridge is then judged on such characteristics as stiffness, lightness, construction speed, aesthetics, efficiency and economy.

The CSUN team, which included students from freshmen to seniors, placed first in last April's regional competition, against teams from 17 universities from Arizona, California, Nevada and Hawaii. At the national contest, held at the University of Washington May 30 through June 2, CSUN came in 16th overall out of 49 teams, placing in the top third of the pack.

What makes the team's repeated successes so remarkable is the fact that the Steel Bridge competition is entirely extracurricular at CSUN—it is not part of any capstone senior design project. "For them to do so well is an indication of how well the program is preparing them for industry and the profession," says Nazaret Dermendjian, professor and chair of the Department of Civil Engineering and Construction Management. ❖

The entire CSUN steel bridge team that went to nationals, consisting of 22 students, four staff members, and one sponsor



## Cybersecurity competitions



From left, at table, Ian Graham, James Camping, Ursula Messick, Rafael Munoz, Brian Marroquin, Ben Ritter and Joseph Legarreta (far back right)

They call themselves Layer 8—a club that strives to go beyond the existing seven layers of cybersecurity by learning different defensive and offensive computer and network security protocols. And although they have only been an official club since May 2012, they have already been making a name for themselves in cybersecurity competitions.

Last March, an eight-member team participated in the three-day Western Regional Collegiate Cyber Defense Competition (WRCCDC) in Pomona, competing against 12 other teams. In the contest's scenario, each team is hired by a fictitious company and given a network of desktops, laptops, servers, virtualized systems and networking hardware to administer and secure. The team has two hours of "safety" to determine what applications and services are on the network before a "red team" of hackers tries to break in and exploit the system. Points are awarded for services staying up, while points are deducted if attackers successfully enter and disrupt the systems. CSUN's team, which was advised by tutorial coordinator Doris Chaney, placed fifth overall.

In the National Cyber League (NCL) competition, which is a virtual competition, students take part in individual play in the fall and group play in the spring. Last year, 17 CSUN students participated in the individual play competition, and ten of those placed in the top ten. In the group play, which took place in May, the CSUN team made it all the way to the semifinals. The competition is growing rapidly in popularity, with some 30 students registered for NCL this year. ❖



Back row from left: Yousef Baqer, Dhaval Prajapati, Bryan Herrera, Carlos Reyes, Louis Josephs, Yousuf Alhrby, Prof. Robert Ryan, Erik Montero, Mohamad Itani, Jonathan Gjemsjo, Eileen Mardrosian, Phillip Egleston, Kevin Tung and Prathamesh Shinde. Front row from left: Daniel Marquez, Abdullah Mohammad, Arman Tadrisi, Russell Osorio, and David Stanley.



## Formula SAE Car

When it comes to auto racing, Lincoln, Nebraska, may not have the same cachet and name recognition as Indianapolis, Laguna Seca or Le Mans, but in June 2013, it became a center of automotive excellence when CSUN's team joined 79 others there from around the world to compete in the 2013 Formula SAE Car competition.

The concept behind the Formula SAE competition, which is sponsored by SAE International (formerly the Society of Automotive Engineers), is that a fictional manufacturing company has contracted with a design team to develop a small Formula-style race car. Each student team designs, builds and tests a prototype based on specific rules. Cars are evaluated on static and dynamic events.

In the static events, CSUN's 22-member team did exceptionally well, ranking second overall in terms of cost.



Student John Ziegler at the wheel (both pictures)

## Human-Powered Vehicle (HPV) Challenge

It's a bicycle—or a tricycle—with a difference. Designed according to sound engineering principles for maximum speed, efficiency, practicality and sustainability, it will never be for sale at your local bike shop. But with its emphasis on innovation, it could help influence the next generation of bicycles available to consumers.

Each year, the American Society of Mechanical Engineers sponsors the Human-Powered Vehicle Challenge, spawning countless cutting-edge bicycles and tricycles that student teams from universities around the world have built for the competition. Teams are scored on their design, men's and women's speed events, innovation and endurance.

CECS mechanical engineering majors have long been enthusiastic participants in the competition, producing a new design for the HPVC as their senior design project every year. In 2013, the team built a three-wheeled recumbent vehicle designed to balance speed and stability. Out of 29 entries at last April's HPV Challenge, held at San Jose State University, the CSUN team, which was advised by mechanical engineering professor Robert Ryan, placed seventh in design and ninth overall, landing in the top third of the field.

This year's CSUN team is already hard at work on their HPV for the next competition, designing a crushable nose section for safety in low-speed impacts and preparing to test their mettle against teams as enthusiastic about human-powered transportation as they are. ❖

"The team did a good job of writing their report and presenting it," says Stewart Prince, professor of mechanical engineering, who advises the team. "And in terms of performance, the car they brought was very cost-effective."

In dynamic events, the CSUN team ranked ninth in fuel economy and 15th overall in terms of endurance, which measures how far the car can go before it breaks. The team's overall ranking for the competition was 17, in the top 20%.

"The objective in the students' minds is to win, but in reality it's to do as well as we can," Prince says. "We're competing against teams from abroad that have a lot of money. We have to look at our student body and the resources we have and figure out how to maximize the points of the competition, so we focus on static events and presentations." Some teams, he says, neglect the static events but produce super high-performance vehicles—an approach that doesn't work at CSUN, where money and facilities are limited. "So we make a relatively inexpensive but high-performance car and focus on the static events," he explains. "That's our focus: balance." ❖



## Unmanned Aerial Vehicle (UAV)

Unmanned aerial vehicles—or drones, as they're commonly known—have been making the news for several years now. But to the CECS seniors competing in the Unmanned Aerial Vehicle (UAV) team, they're nothing new. Large numbers jump at the opportunity to design, build and fly one in the annual competition organized by the Association for Unmanned Vehicle Systems International (AUVSI); the UAV also serves as the senior design project for most.

"There's lots of interest in this area," says Tim Fox, professor of mechanical engineering, who advises the team. "This project is truly multidisciplinary, more than other projects. Students work with composites, auto-pilots, computer systems and imaging systems. It covers virtually every course in the mechanical engineering program."

The most recent competition was held at the PAX River Naval Air Station in Eastern Maryland in June. CSUN's entry, a 15-pound fixed-wing UAV called the Q-31 Foxtail in honor of Fox, was designed to autonomously take off; climb; demonstrate aerial waypoint navigation, in-flight route rescheduling and in-flight communication with a remote ground-based computer system; and conduct an aerial search for objects on the ground before returning home and landing autonomously. Q-31 Foxtail placed ninth overall out of the 36 schools registered for the competition and particularly excelled at three challenges. One was to establish an aerial Wi-Fi link between the vehicle's ground control station and remote computer and interpret a message. Communication took place through the aircraft and required opening and extracting a file while the plane was still in the air. CSUN's UAV was one of only six that were able to complete the task. It was also one of only nine aircraft that were able to autonomously take off, fly their mission and return after the mission was over. And the CSUN team placed third in the journal paper component.

For the coming year, the CSUN team is looking at developing a solar-powered version of the plane, which will significantly extend its operating time. ❖

# Students show their stuff at Senior Design Project Showcase

"I've always been a big fan of students doing projects because that's where you learn engineering," says Charles Volk, vice president and chief technologist at Northrop Grumman's Navigation Systems Division. "It's the best way to see what students are capable of."

Judging by the responses to the fourth annual Senior Design Project Showcase, which was held April 19, 2013, in the University Student Union, CECS students are capable of a lot, and they really shine when they have to translate what they've learned in the classroom to real-world applications.

The Senior Design Project Showcase is a chance for senior engineering and computer science students from each department to display their capstone projects, which are a major part of their education, and compete for prizes. A panel of 20 distinguished judges from industry determines the winning projects. The projects have been growing steadily in sophistication, and the event has gained momentum every year since its inception. This past year, in addition to moving to a larger venue, the showcase attracted generous sponsorships from industry partners Anheuser-Busch, Boston Scientific, Canoga Perkins, Northrop Grumman, Pratt & Whitney Rocketdyne (now Aerojet Rocketdyne) and Verizon. The funds from the sponsorships go to support the student projects.



College Industry Advisory Board member Jack Buhn (left) speaking with a student at the Assisted Gripping Rig display.

While the top prize went to the Assisted Gripping Rig, designed by a team of manufacturing systems engineering and management majors to augment the grip of a variety of users with restrictions on movement, all who completed a senior design project and took part in the showcase came out winners simply by participating in an experience that significantly advanced their understanding of their field and laid a solid foundation for their future careers. ❖

"It's really a wonderful event. I look forward to it. There's so much energy and excitement, and the teams are really into their work. It's a great competition, and it highlights the hands-on capabilities of the engineers at CSUN. They are great with theory, but they shine with the hands-on applications. As judges, we interview each team and do a review, and we don't know who's going to win until we count every vote. One of my favorites each year is the Human-Powered Vehicle. It's great to see what they come up with." —Chris Erickson, Aerojet Rocketdyne; judge, sponsor





President Harrison and Dean Ramesh at the Autonomous Aircraft for Aerial Observation display.

“Every year I have been there, I have been impressed by the capabilities of the students and the level of sophistication of some of the projects. One that impressed me quite a bit this past year was a tool distribution facility. The students surveyed local businesses as to their needs and what would serve their purposes. They really put some deep thought into building something that served a need. In the estimate of several of us, they created a project that could quite easily be turned into a product. There were a number of projects of that caliber. The high level of creativity of these individuals is what we ultimately look for in employees.” —Charles Volk, Northrop Grumman; judge, sponsor



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“What’s interesting about the showcase is that it affords me the opportunity to review the work of students that truly are tinkering outside of mainstream academia. At CSUN I have had a chance to meet with very bright students, and that’s what I find really exciting. I would be happy to serve as a judge again. I have a high regard for the CECS program at CSUN.” — Bill James, Avery James, Inc.; judge

## 2013 SDPS Awards

### Project Displays

1. 1st Place: Assisted Gripping Rig team
2. 2nd Place: Human Powered Vehicle
3. 3rd Place: Formula SAE team

### Oral Presentation Winners by Department

4. **CECM:** Sanford Consortium for Regenerative Medicine Project in La Jolla team
5. **ME:** Formula SAE team
6. **MSEM:** Assisted Gripping Rig team
7. **ECE:** CSUN Micromouse team
8. **CS:** SS12 Audio Alert System team



Photos by Armando Tellez and Leo Chio

“The thing that impressed me was the diversity of the projects. It gave me a really good idea of what the school was teaching the students. The teams were asked to look at financials and schedules and markets, which was unique. The whole event showed how much the professors care about their students. The students should appreciate the amount of time and education these guys give to them.” —Naomi Palmer, Jet Propulsion Laboratory; judge



Display project judges from left, Naomi Palmer, Charles Volk, Felix Rabinovich, Bill James and Chris Erickson at the Audio Alert System display.

“It was refreshing to see students really excited about technology and engineering, and there were some really creative projects. A lot of ideas were very futuristic, and very likely we will see some of them live. One team had crafted a robotic vehicle that could take instruction from someone disabled. I was also thoroughly impressed with the students, who were very professional and able to articulate what the projects were. I would encourage people who have heard of the showcase but never taken time to stop by to make time to check it out.” —Julia Cooksey, Verizon Southern California; sponsor



Julia Cooksey, Verizon, speaking with student from the IGV Team.



Demonstrating the micromouse to Peter Leonhardt



7

“The most impressive part is the completeness of the projects. They aren’t just student-type projects that end with the end of semester, but the things they do like the race car, like the aerial vehicles, are complete designs that are actually functional, practical and very useful.” —Felix Rabinovich, Amgen; judge

Below, oral presentation and display project judges with faculty and staff





Photos by student photography interns: Ka-Yun "Kai" Chan, Monica Jose and Tiffany Randle

## Second annual Alumni Networking Night is a big success

For the second year in a row, more than 100 CECS alumni returned to campus for Alumni Networking Night, an informal reception that encouraged them to mingle with faculty and former classmates, rekindle friendships and establish new connections. All alumni were invited to the August 29 event, which was hosted by the CSUN Alumni Association to muster support for the nascent CECS chapter of the association. The evening featured remarks by Dean S. K. Ramesh, who gave an update on the college and its vibrant growth, and Gray Mounger, who heads the college's alumni chapter and spoke about plans for the group, encouraging alumni to step forward to take leadership positions.

"I was delighted with the response—that so many alumni cared enough to take the time to come," says Mounger. "As we gather momentum for the college's alumni association chapter, I'm confident that we will engage more and more graduates, who will appreciate the unique value that we provide, for the college and for the alumni themselves."

If you would like to be part of this historic effort, contact Susan Andraus, director of development, at 818.677.3850 or [susan.andraus@csun.edu](mailto:susan.andraus@csun.edu). ❖



## Donors, scholarship recipients meet and greet at reception



CECS scholarship donors and recipients had an opportunity to meet one another and get acquainted last May at the college's Donor-Scholar Reception. The event served several purposes: students were able to thank their benefactors face to face and learn about the value of philanthropy—a lesson that will serve them well later in life. Donors got to see for themselves the quality of CECS students and hear firsthand about the difference their scholarship support was making in the lives of the recipients and their families.



A significant percentage of CECS students are first-generation college students, and they often must work while attending school to make ends meet. Scholarships are critical factors in accelerating their time to graduation and advancing their academic standing, since they allow students to focus more effort on their studies and minimize the hours they spend working at outside jobs. The funds also enable them to avoid massive student debt, which often limits their career options and life choices after graduation.



The Donor-Scholar Reception was a reminder of just how rewarding scholarship support is to both the college's students and the generous men and women who provide it. ❖

Photos by Armando Tellez

## CONGRATULATIONS TO THE COLLEGE'S SAN FERNANDO VALLEY ENGINEERS' COUNCIL 2013 AWARDEES!



### Distinguished Engineering Educator Award

Professors Shan Barkataki • Nazaret Dermendjian • David Schwartz

### Outstanding Engineering Achievement Merit Awards

Professors Vibhav Durgesh • Emad Elwakil • Jimmy Gandhi • Adam Kaplan • Kourosh Sedghisigarchi

### Distinguished Engineering Project Award

*International Champion Intelligent Ground Vehicle - Red RAVEN*

Faculty Advisor Prof. C. T. Lin

Students Alex Anikstein • Alfie Gil • Amiel Hartman • Nicholas Keyawa • Garrett Leonard  
Harout Markarian • Ara Mekhtarian • James Mohan • David Prince • Paul (Po-Jen) Wang



Intelligent Ground Vehicle - Red RAVEN Team



CECS dean S. K. Ramesh chaired the 2013 IEEE Educational Activities Board Awards and Recognition Committee. Mr. Narayana Murthy (seated), CEO of Infosys Corporation, received the Eminent Member Award for IEEE-HKN (the electrical engineering honor society) at the awards ceremony held in New Jersey on November 22. Also pictured (back row, from left): Dean Ramesh; Dr. Michael Lightner, 2013 vice president, IEEE Educational Activities Board; and Dr. John Orr, 2013 president, IEEE-HKN.

## The College welcomes back Kathleen Pohl



Kathleen Pohl

Last June, **Kathleen Pohl** returned to the college as the dean's assistant. A fixture in the Department of Electrical and Computer Engineering for 13 years, she spent the past five years as the finance and procurement supervisor in the Oviatt Library. With her administrative expertise and in-depth knowledge of the college and the university, everyone at CECS is delighted to have her back and looks forward to working with her for many more years.

## Steven Stepanek Appointed to CSU Board of Trustees



Steven Stepanek has stepped down as chair of the computer science department to serve on the California State University Board of Trustees. Stepanek was appointed by Governor Jerry Brown to represent faculty interests on the 25-member board, which is responsible for the oversight of the 23-campus CSU system. He is the first CSUN faculty member to be appointed to the board.

Stepanek has spent more than 40 years at CSUN, earning his bachelor's degree in mathematics from the campus in 1974 and his master's degree in computer science in 1980. He has been working in the Department of Computer Science since 1976, first as a lecturer and then as a full-time professor, earning tenure in 1984. He served as department chair for 14 years and was a member of the CSUN Faculty Senate from 1994 to 2013, elected to its executive committee for most of those years. He spent the past eight years as a member of the CSU statewide Academic Senate and has served on several statewide committees.

Stepanek's two-year appointment to the CSU Board of Trustees is a full-time position. In addition to attending CSU trustee meetings, he will be traveling to CSU campuses across the state to meet with faculty about the issues that are important to them. "But CSUN will always be my home base," he says. "When I am not traveling, I will be here. I want to stay connected with the campus. It'll help me keep grounded, and the knowledge I gain at CSUN and from my visits to other CSU campuses will assist me in carrying out my responsibilities on the board." ❖

# Department and Faculty News

## Computer Science



Richard Covington

**Richard Covington** has been named the new chair of the Department of Computer Science. Covington, who earned his Ph.D. in electrical and computer engineering from Rice University, joined the CECS faculty in 2000 as an assistant professor of computer science. He became an associate professor in 2006. He teaches advanced courses in graphical user interfaces and parallel computer architecture and currently is involved in curriculum development for the new undergraduate program in computer information technology.

## Electrical & Computer Engineering



Shahnam Mirzaei



Ramin Roosta

**Shahnam Mirzaei, Ramin Roosta** and graduate students Alexander Standridge and Calvin Ho recently published an article titled "Efficient Bitcoin Miner System Implemented on Zynq SoC" in *Xcell Journal*, issue 84 (third quarter 2013), pp. 16-22.



Sembiam Rengarajan

**Sembiam R. Rengarajan**, professor of electrical and computer engineering, has had a productive year, publishing journal articles in the *International Journal of Computer Aided RF and Microwave Engineering*, *Progress in Electromagnetics Research* and *IEEE Antennas and Wireless Propagation Letters* (with C. R. White) and presenting papers at the National Radio Science Meeting in Boulder, Colorado; the URSI Electromagnetic Theory Symposium in Hiroshima, Japan; and the IEEE International Antennas and Propagation and USNC URSI Radio Science Meeting in Orlando, Florida.

In addition, **Rengarajan** has been serving a three-year term as a Distinguished Lecturer for the IEEE Antennas and Propagation Society, delivering lectures on the design, analysis and applications of waveguide-fed slot arrays all over the world. He was also appointed to the editorial board of the *International Journal of RF and Microwave Computer Aided Engineering* and continued to serve on the editorial committee of the *International Journal of Antennas and Propagation*. He has been chairing the Commission on Waves and Fields of the United States National Committee of the International Union Radio Science (USNC/URSI) for the triennium 2012-14.

## Civil Engineering & Construction Management



Nazaret Dermendjian

CECM department chair **Nazaret Dermendjian** has been elected to the 2013-14 board of the American Society of Civil Engineers (ASCE), Los Angeles Section, as vice president of student activities.

continued on page 30

# Department and Faculty News

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## Manufacturing Systems Engineering & Management



Jimmy Gandhi

**Shereazad Jimmy Gandhi** is the newly elected advisor to the MSEM department's Engineering Management Student Association (EMSA). In November 2013, he was a guest speaker on outsourcing at the University of North Texas.



Ahmad Sarfaraz

**Ahmad Sarfaraz** co-authored eight journal papers with his graduate students in the areas of knowledge management, risk and reliability. The papers have appeared in the *International Journal of Biomedical Engineering and Technology*, *International Journal of Business Excellence*, *International Journal of Management and Decision Making*, *International Journal of Industrial and Systems Engineering (IJISE)*, *International Journal of Strategic Decision Sciences (IJSDS)*, *International Journal of Applied Decision Sciences (IJADS)*, and *Benchmarking: An International Journal*.



Alireza Kabirian

**Alireza Kabirian** and David Alba, co-founder and president of GRID Logistics, Inc., made a presentation at CSUN's Art of Innovation Conference on June 21, titled "Green Innovations in San Pedro Bay Ports," which proposed genuine 21st century freight transportation solutions for the region.



Ileana Costea

**Ileana Costea** participated in numerous Project Lead the Way (PLTW) and school network meetings (Glendale Community College, Monroe High School, Santa Clarita High School, College of the Canyons, Monroe High School and Reseda High School) as part of the CSUN STEM Innovations Team. The team, known as ESTEME, is led by Susan Belgrad, a professor from the College of Education, and seeks to map a pipeline to "enhance the 'E' in STEM education" to schools as partners from kindergarten to career.

Costea also serves on the engineering advisory board at Moorpark College and has made several invited presentations. In addition, she is part of the organizing committee of the Deming Conference, which will be hosted at CSUN in October 2014. She co-authored two papers presented at the ASEE Annual Conference in Atlanta in June: "Development of a Minor in Sustainable Manufacturing for a Manufacturing Systems Engineering Program" and "Modifications of the Engineering Management Program at Cal State University, Northridge."



Mark Rajai

**Mark Rajai** is editor-in-chief of the *International Journal of Modern Engineering (IJME)* and *International Journal of Engineering Research & Innovation (IJERI)*. Based on the latest impact factor (IF) calculations, IJME has an IF of 3.0. IJERI has also made a strong showing, with an IF of 1.58. An IF above 1 is considered high, based on the requirements of many top universities, and means a journal is part of an elite group.

## In Memoriam

Sadly, the College of Engineering and Computer Science lost two good friends in 2013: Professor Emeritus William Freeman, husband of Professor Emerita Bonita Campbell, who died on April 27, 2013, and Mary Lou Downing, wife of Professor Emeritus Willis Downing, who died on March 5, 2013. We extend our deepest sympathies to our colleagues and their families.



Professor Emeritus  
William Freeman



Mary Lou  
Downing

# COMMENCEMENT 2013

## GRADUATING SENIOR WINS TOP HONORS IN CECS AND UNIVERSITY



Shelley Thurk ('13) was working as an assistant service manager at a car dealership in Encino, but she was bored. Although she had always been drawn to cars and had earned an A.A. degree specifically because she wanted to work in the automotive industry, she realized after a year that she was more interested in design and building. Vacillating between architecture and engineering, she was looking into schools when she saw CSUN's Formula SAE car and discovered her future.

"I wanted to be part of that," she says.

In 2009, she enrolled in the College of Engineering and Computer Science as a mechanical engineering major and

quickly plunged into her studies. She particularly appreciated how accessible the faculty was and the applied nature of the curriculum, which stressed hands-on experiences rather than concentrating exclusively on theory.

"A lot of what we learned applied to actual industry rather than straight textbook problems," she says.

She went on to gain industry experience herself through two internships. And, of course, she joined the Formula SAE team.

But college had a surprise in store for her. At Tech Fest one year, she encountered the Boston Scientific Neuromodulation booth, and it changed her life. She was so intrigued by what she learned there that she decided to redirect her career goals to the medical device industry. When she was accepted into the college's Honors Co-Op program, she landed a position at Medtronic MiniMed, an experience she describes as "by far the best thing that has happened to me during my time at CSUN."

Thurk participated in faculty research and tutored other students in multiple subjects. She made the dean's list every semester and was recognized with numerous scholarships and awards, including the Presidential Scholarship and University Scholars Scholarship. Her academic accomplishments were so impressive that she was named the 2012-13 Distinguished College of Engineering and Computer Science Graduating Scholar—a significant honor all on its own.

But the recognition didn't end there. At the Honors Convocation last May, Thurk learned that she was receiving the 2013 Wolfson Scholar Award—the highest honor awarded to a CSUN graduating senior.

Today Thurk is working for Boston Scientific in her native Minnesota, in the company's interventional cardiology division. She is also attending graduate school in mechanical engineering part time at the University of Minnesota, which has a strong focus on medical devices for research—an emphasis that dovetails perfectly with her own interests. In all likelihood, however, she would not have found herself where she is without her four, very fulfilling years at CSUN. ❖



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MSEM professor  
Jimmy Gandhi



Associate Dean  
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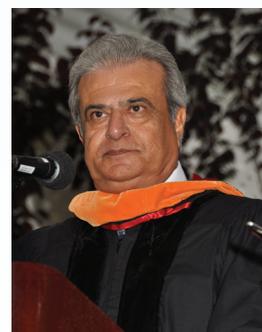
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# COLLEGE'S DONOR HONOR ROLL - JULY 2012 TO JUNE 2013

It's been an especially successful year for the College of Engineering and Computer Science, thanks in good measure to the support of numerous friends. Corporations, foundations and individuals alike stepped forward with generous contributions, increasing the number of scholarships available for deserving students and expanding the programs the college could present. For the first time the California Renewable Energy Storage and Technology Conference had a sponsor, for example, and the number of sponsors for the Senior Design Project Showcase grew significantly.

It is because of these donors' vision and generosity that the college has been able to establish—and sustain—a rare level of excellence in engineering and computer science education. Today's CSUN education is preparing tomorrow's engineers and computer scientists for careers of innovation, distinction and relevance, in partnership with its supporters.

It is with pride and gratitude that we publish the following Donor Honor Roll, which recognizes our many donors, whose commitment is making it possible.

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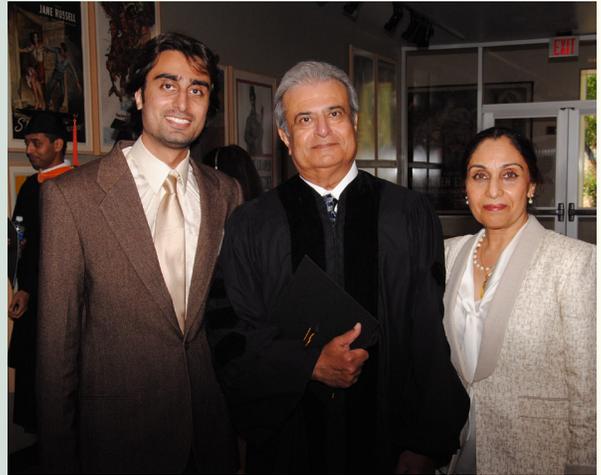
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*Susan Andraus*  
*Development Director*  
*College of Engineering & Computer Science*  
*Phone: 818.677.3850*  
*Email: susan.andraus@csun.edu*



The Madni family from left: Jamal, Asad and Taj Madni.

## Madni family issues challenge grant to endow scholarship

**D**r. Asad Madni not only has had an illustrious career as an internationally renowned innovator, executive and civic leader; he has been actively involved at the College of Engineering and Computer Science for over two decades (see page 7). Because of his deep commitment to the college and its students, he and his family have created a challenge grant to endow an undergraduate scholarship in the Department of Electrical and Computer Engineering. For every dollar that donors contribute to the scholarship endowment, the family will match it, up to \$25,000.

Endowment is money that is invested to produce income. Only the yield is spent, while the principal remains inviolate, producing income in perpetuity to support an institution's highest priorities. A contribution to the Asad, Taj and Jamal Madni Scholarship will leverage the Madnis' gift, serving as an outstanding investment in the college and the young men and women whose education it helps fund, now and for decades to come.

For more information about the Asad, Taj and Jamal Madni Challenge Grant and Scholarship, contact Susan Andraus, director of development, at 818.677.3850 or [susan.andraus@csun.edu](mailto:susan.andraus@csun.edu).

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From the Class of '66. Contributed by Michael Gallo (second row, far left). If you are in the photo, we would love to hear from you!

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