

WINTER 2014

# ENGINEERING AT SAN JOSÉ STATE

CHARLES W. DAVIDSON COLLEGE OF ENGINEERING

*powering* Silicon Valley



Mark and Carolyn Guidry  
Foundation Gives \$2.5 Million for  
Engineering Education Professorship

Gayle Guidry Dilley  
President, Mark and  
Carolyn Guidry Foundation



**SAN JOSÉ STATE**  
UNIVERSITY





## Greetings!

I'm happy to share this opportunity to learn about some of the exciting accomplishments, changes and opportunities that abound at the Charles W. Davidson College of Engineering. As the newest issue of our engineering magazine makes clear, our students, faculty, staff and administrators are working together to cement our reputation as Silicon Valley's top-ranked source for engineers with an unparalleled combination of global focus, practical education and start-up spirit.

Some highlights in this issue include the college's fast-track efforts to help San José State University become a world leader in cybersecurity and big data research, our gratitude to the Mark and Carolyn Guidry family for their \$2.5 million gift that will strengthen engineering education, and our success in recruiting four outstanding new faculty members whose backgrounds and ambitions may surprise you.

These sorts of accomplishments help explain why the college ranks so high in terms of quality, satisfaction and post-graduation job success not only among public engineering programs, but also in comparison to *all* engineering colleges that train undergraduate and graduate students. You can check out the specifics in the various Fast Facts that appear in this magazine.

You'll also meet some of our outstanding students who are forging interdisciplinary and international teams to produce transportation solutions in water, on land and in orbit—and you'll meet one team who's chosen to match brains with today's craftiest generation of artificial intelligence. Along the way, you'll get a chance to catch up with two extraordinary associate deans, one working to strengthen our industry ties and one moving on to new adventures.

These stories reflect the talent, dedication and vision of a remarkable community, and they forecast exciting times to come. Think of it. We've seen a 25-percent increase in engineering enrollment in just the past year, which means that we've become the largest engineering program in the entire 23-campus California State University system. The Charles W. Davidson College of Engineering is clearly on the forefront of tackling today's problems and building tomorrow's solutions.

Read on, learn more and stay in touch!

Sincerely,

Andrew Hsu  
Don Beall Dean of Engineering  
Charles W. Davidson College of Engineering



## INSIDE THIS ISSUE

|                            |    |
|----------------------------|----|
| Dean's Message             | 2  |
| Guidry Endowment           | 3  |
| Four New Faculty           | 4  |
| Cybersecurity and Big Data | 6  |
| NASA Mission               | 8  |
| NSF Grants                 | 10 |
| Fast Facts                 | 11 |
| Student Achievements       | 12 |
| Industry Partnerships      | 16 |
| Dr. Emily Allen Farewell   | 18 |
| Alumni News                | 19 |



## Alumni Generosity:

# Mark and Carolyn Guidry Foundation Gives \$2.5 Million for Engineering Education Professorship

Davidson College of Engineering graduates are renowned not only for their contributions to science and technology, but also for their commitment to giving back. Just this year, the college received a \$2.5 million gift commitment from the Mark and Carolyn Guidry Foundation to establish the Carolyn Guidry Professorship for Engineering Education. This is in addition to a pledge of \$250,000 to support the college's Women in Engineering program.

The Carolyn Guidry Professor of Engineering Education will be a senior faculty member who is a national leader in engineering education and higher education research. The Guidry Professor will work to pioneer innovative approaches and strategies for teaching engineering students at the university level.

The late Carolyn Guidry earned her MS in Computer Engineering at San José State in 1979. She and her husband, Mark Guidry, who has a PhD in Electrical Engineering, played major roles in Silicon Valley for decades. Among her many achievements, Carolyn helped design computers at Hewlett-Packard. She and Mark also co-founded two highly successful companies in the semiconductor industry. Meanwhile, they raised three children, all of whom have degrees in engineering or computer science. Their second son, Mike, earned his BSEE here at SJSU.

Rather than rest on their laurels upon retirement, they created the Mark and Carolyn Guidry Foundation and devoted their considerable energies to philanthropic support of education and the arts. Their generous gift to SJSU will be a lasting legacy that strengthens the university's position as a national leader in the transformation of engineering education.

"My family strongly believes in the power of education," said Gayle Guidry Dilley, Carolyn's daughter and president of the Mark and Carolyn Guidry Foundation. "Our vision is to produce engineering graduates with the tools needed for the world as it will be, not merely as it is today. We are delighted to make this gift to SJSU to help achieve that crucial goal."

Said Dr. Andrew Hsu, dean of the Davidson College of Engineering, "Thanks to the Guidry family, our graduates will be even better prepared to tackle the world's toughest problems and excel in our global economy. The Guidry Professorship will further enhance the outstanding efforts of our faculty in the area of engineering education research. We are extremely grateful."



The Guidry family gathering on Bainbridge Island in Washington (2004). Back row: David, Jennifer, Carolyn, Mark, Gayle, John, Mike, and Barbara. Front row: Charlotte, Emily, Anna, Mark, Paul, and Samantha.



Dean Andrew Hsu and the Guidry family (Mark with sons Mike and David) celebrating at the SJSU Spartan football game (2013).



## AWARD-WINNING PROFESSORS JOIN OUR WORLD-CLASS FACULTY

This fall we were joined by four outstanding new faculty members. They bring to SJSU their experience and expertise, passion and leadership, vision and inspiration. Together with their research colleagues, students and industry partners, they are working to change the world.

### COMPUTER ENGINEERING MEIKANG QIU ASSOCIATE PROFESSOR

With more than 170 journal and conference papers to his credit, to say nothing of multiple awards, three books and three patents, Meikang Qiu is representative of the high-caliber faculty who are making SJSU an engineering powerhouse.

At SJSU, Professor Qiu is continuing his research into low-latency, low-power heterogeneous memory access, funded by a National Science Foundation grant. The memory wall is the bottleneck of the development of computer and network systems, he explains. His objective is to improve the memory performance by developing a heterogeneous hierarchy and corresponding management strategies to reduce memory access latency and power consumption.

Professor Qiu earned his BS in Engineering and MS in Engineering from Shanghai Jiao Tong University. He holds a MS in Computer Science and a PhD in Computer Science from the University of Texas at Dallas.

### COMPUTER ENGINEERING YOUNGHEE PARK ASSISTANT PROFESSOR

Younghee Park has been tackling crucial challenges in cybersecurity since the beginning of her academic career. She has received numerous awards and honors for her work. Her research interests include many aspects of cybersecurity, with an emphasis on malware detection, insider attacks, botnets and IP traceback. She is working on developing trustworthy smart grid networks, secure against malware propagation, and implementing systems based on smart grid protocols. She is addressing security problems in mobile cloud computing.

Professor Park has a BS in Computer Engineering from Kyungsung University. She holds a MS in Computer Science from Korea Advanced Institute of Science and Technology and a PhD in Computer Science from North Carolina State University.

### BIOMEDICAL, CHEMICAL AND MATERIALS ENGINEERING FOLARIN EROGBOGBO ASSISTANT PROFESSOR

Folarin Erogbogbo is researching solutions to three urgent health care challenges. First, with his industry partners, he is developing a drug that can be administered en route to a hospital to reduce damage from a heart attack. Second, Erogbogbo is developing revolutionary optical imaging agents that can detect specific cancers through noninvasive infrared light probes. Third, he and his team are working to discover ways to accurately detect prostate cancer at an early stage. These exciting projects have the potential to save countless lives.

Professor Erogbogbo holds a BS in Chemical Engineering and a PhD in Chemical and Biological Engineering from the University of Buffalo (SUNY).

### AEROSPACE ENGINEERING KAMRAN TURKOGLU ASSISTANT PROFESSOR

Kamran Turkoglu is a widely praised expert in dynamic systems, specifically on aerospace vehicles. At SJSU, he is researching real-time optimal guidance strategies to minimize fuel consumption by harvesting wind energy during flight. His other research interests are robust flight control systems, time-delayed systems, hard disk drives and new control theory applications for more sophisticated unmanned aerial vehicles. His goal is to provide unique contributions to the fields of trajectory optimization, flight control systems and control theory.

Professor Turkoglu holds a BSc in Aerospace Engineering, a BSc in Aeronautical Engineering, and a MSc in Aerospace and Aeronautical Engineering from Istanbul Technical University. He has a PhD in Control Science and Dynamical Systems from the University of Minnesota.

THE DAVIDSON COLLEGE OF ENGINEERING FACULTY ENJOYS AN INTERNATIONAL REPUTATION FOR ACADEMIC EXCELLENCE. RENOWNED ENGINEERS AND SCIENTISTS, GROUNDBREAKING RESEARCHERS AND SUPERB EDUCATORS, OUR FACULTY MEMBERS COME TO SJSU FROM LEADING UNIVERSITIES AND ORGANIZATIONS AROUND THE WORLD. THEIR EXCEPTIONAL DIVERSITY MIRRORS THAT OF OUR COLLEGE.

“To me, teaching and research are two complementary processes. Research is the discovery of knowledge while teaching is the dissemination of that knowledge. I view success in the academic life as doing well in both teaching and research.”

*Computer Engineering  
Meikang Qiu,  
Associate Professor*

“I believe success in real life comes through mastering the core of the material in hand. I value discussing different ideas and learning from other perspectives. Students gain unique insights into the problems that we are working on and trying to solve.”

*Aerospace Engineering  
Kamran Turkoglu,  
Assistant Professor*

“My educational philosophy is to connect students to the real world. Students need theory, but they also need insight and experience with actual real-world problems and solutions.”

*Computer Engineering  
Younghee Park,  
Assistant Professor*

“It’s all about the students. I love working with students in a wide range of disciplines, mentoring them along the way, discovering new things and taking them to the next level.”

*Biomedical, Chemical and  
Materials Engineering  
Folarin Erogbogbo,  
Assistant Professor*





# Building on a World-Class Foundation, SJSU Elevates Its Cybersecurity Leadership Position

**NEW FACULTY EXPANDS THE DAVIDSON COLLEGE OF ENGINEERING KNOWLEDGE BASE FOR PROTECTING DATA, NETWORKS AND CRITICAL INFRASTRUCTURE FROM SECURITY VULNERABILITIES.**



In a move spearheaded by President Mohammad Qayoumi, SJSU recently turbocharged the brainpower driving its cybersecurity practice by adding nine new faculty members to its interdisciplinary Cybersecurity and Big Data Initiative. Bringing together scholars from fields as diverse as computer engineering, psychology, business and information science, an objective of the initiative is to advance cybersecurity best practices and technologies through collaborative research and inquiry.

“In today’s big data universe with ubiquitous, embedded systems and universal connectivity, private information and critical infrastructure like power grids and the financial system have never been so exposed to so many vulnerabilities,” noted Sigurd Meldal, director of the Cybersecurity and Big Data Initiative and chair of computer engineering. “By combining the broad perspectives of several fields of study, we expect to develop innovative insights to help industry and government tackle emerging security issues,” he added.

## **DIVERSE PERSPECTIVES CONVERGE TO DELIVER A UNIFIED VISION OF SECURITY BEST PRACTICES**

A 2012 campus visit by then U.S. Secretary of Homeland Security Janet Napolitano was the impetus behind the faculty additions. After inviting Napolitano to address students and faculty, President Qayoumi requested a skills audit of departments with complementary expertise to see which were best suited to assist Department of Homeland Security (DHS) cybersecurity initiatives.

Identifying areas that would benefit from greater support guided departmental hiring decisions. Subsequently, the Department of Computer Engineering brought on National Science Foundation (NSF) grant winner and embedded systems security expert Meikang Qiu. As key components of transportation,

power, financial and medical infrastructure, embedded technologies require robust security to protect systems vital to modern, everyday living. Another Department of Computer Engineering hire, Younghee Park, specializes in technologies for protecting today’s smart power grids. Other new Cybersecurity and Big Data Initiative members have backgrounds in network security, software engineering and management information systems. To address human factors related to protecting networks and information from intrusion, theft, and fraud, and to develop better methodologies for long-term data preservation, experts in psychology and information science also are included in the initiative.

“San José State is the largest supplier in the world of engineering talent to Silicon Valley. With cybersecurity expertise in such high demand, we have an obligation to provide Silicon Valley and California with highly qualified experts.”

*Sigurd Meldal, director of the Cybersecurity and Big Data Initiative*

## **AN INTERDISCIPLINARY APPROACH BEGINS TO BEAR FRUIT**

In just the first few months, initiative members have begun to actively collaborate on research and publishing projects. For instance, Professor Xiao Su in computer studies, Professor Leslie Albert in management of information systems and Professor Melody Moh in computer science are working on the certification of SJSU as a Center for Academic Excellence for the National Security Agency (NSA) and the DHS. Additionally, initiative members are creating an undergraduate cybersecurity certificate program—soon to be extended to graduate students—that will enable SJSU students to apply credits to their degree programs while achieving specialized expertise in cybersecurity.

It’s all part of the university’s commitment to help develop and sustain a competent workforce for California’s future, particularly as it pertains to engineering and technology. And given the university’s location, it’s no surprise that it plays an outsized role in feeding into Silicon Valley’s skilled workforce. “Fact is, San José State is the largest supplier in the world of engineering talent to Silicon Valley,” observed professor Meldal. “And since cybersecurity expertise is in such high demand, we have an obligation to provide Silicon Valley and California with highly qualified experts.” To further support this objective, the Davidson College of Engineering is reaching out to nearby colleges such as De Anza, Foothill, Cabrillo and Evergreen Valley to help guide skill-development strategies. Because they play such a central role in preparing students—new and returning—for technical careers, the university’s ultimate goal is to help craft cybersecurity curricula for local community colleges.

## **NO NEWCOMER TO CYBERSECURITY**

The addition of new faculty to the Cybersecurity and Big Data Initiative is only the university’s latest step in becoming an internationally recognized leader in the field. SJSU has been making great strides along this path for more than a decade. Some examples from our broad range of activities:

- **National Symposium on Cybersecurity Education:** The university hosts an annual conference that focuses on network security, secure technologies, privacy and other critical issues. Since 2005, the symposium has become an important knowledge-sharing opportunity for representatives of government, industry and academia worldwide.

**IN THE HEART OF SILICON VALLEY, SJSU HAS BEEN AT THE CENTER OF CYBERSECURITY KNOWLEDGE AND INNOVATION—FIGURATIVELY AND LITERALLY—FOR MORE THAN A DECADE.**

- **National Science Foundation Team for Research in Ubiquitous Secure Technology (NSF TRUST):** The university is a founding partner in TRUST, a federally funded national science and technology center at UC Berkeley (the other partners, besides San José State, are Stanford University, Cornell University, Carnegie Mellon University and Vanderbilt University) dedicated to addressing technical, operational, legal, policy and economic issues affecting security, privacy and data protection, as well as the challenges of developing, deploying and using trustworthy systems. Professor Meldal has been a co-director of TRUST since 2005.

- **Mineta Transportation Institute:** Several departments in the Davidson College of Engineering regularly work with the institute to develop security solutions for mass transit systems.

- **Bay Area Council Cybersecurity Committee:** With representatives from business, industry, government and academia, the committee develops strategies to help ensure that Bay Area educators are creating the security skillsets needed today—and tomorrow. Professor Meldal serves on the committee.

- **Cyber Challenge:** San José State partnered with Visa and the Bay Area Council to host the annual U.S. Cyber Challenge Northern California Cybersecurity Summer Boot Camp. The weeklong camp teaches students to evaluate network security and provides them with firsthand experience detecting intrusions through simulated attacks.

## **AS DEMAND GROWS, SO TOO DOES OUR EXPERTISE**

With ubiquitous connectivity, increasingly complex systems and the explosive growth of threats from a growing roster of sophisticated, international players, networked systems have never been so vulnerable. Consequently, the need for cybersecurity expertise has never been more acute. Located in the heart of Silicon Valley, San José State has been at the center of cybersecurity knowledge and innovation—figuratively and literally—for more than a decade. With the university’s newly reinforced Cybersecurity and Big Data Initiative, the leadership position in the field for the Davidson College of Engineering just became even stronger.



## **NATIONAL RECOGNITION FOR SJSU SECURITY EXCELLENCE**

Sigurd Meldal, chair of the Department of Computer Engineering and co-director of the National Science Foundation Team for Research in Ubiquitous Secure Technology (NSF TRUST), received the certificate from Richard Hale, deputy chief information officer for Cybersecurity for the Department of Defense.



IMAGINE BEING A COLLEGE STUDENT AND HAVING THE OPPORTUNITY TO PARTICIPATE IN A TRAILBLAZING NASA MISSION—FROM FORMULATION THROUGH DECOMMISSION OF A SMALL SPACECRAFT. THIS IS ACTUALLY AN EVERYDAY EXPERIENCE FOR SJSU AEROSPACE ENGINEERING STUDENTS.

## AEROSPACE ENGINEERING STUDENTS KEEP SPACECRAFT SOARING

Along with their adviser, Professor Periklis Papadopoulos, SJSU aerospace engineering students made international news when TechEdSat, their innovative, hand-built, cube-shaped satellite, 10 centimeters on each side, was deployed into space from the International Space Station (ISS) in fall 2012.

TechEdSat was just the beginning of this unique collaboration between NASA, academia and industry.

Continuing its small CubeSat legacy, earlier this year Professor Papadopoulos' class in spacecraft design and transportation began working on a second-generation small satellite series. Using technology developed from its predecessor, students designed, built, and flew TechEdSat-3p and lowered production time to about six months from concept to delivery. Last month, it became the first 3U CubeSat deployed from the ISS and will demonstrate a rapid deorbit system, as well as an email-driven communication system.

"Our students are working on projects today that have long-range implications for future NASA earth and planetary missions," said Papadopoulos.

Currently, engineering students are captivated by an entirely new challenge: AztechSat-1. Drawing from his TechEdSat-3p experience, Jose Mojica, now an SJSU grad student, along with Jonathan Benson and Adam Reuter, are serving as advisors on this collaboration between SJSU, NASA and two universities

in Mexico: Universidad Autónoma de Baja California (UABC) and Instituto Politécnico Nacional (IPN). Seventeen students are working on the mission—eight SJSU students and nine students from Mexico, six of whom reside locally. Students meet either at SJSU or Moffett Field and use email and Google Chat to connect with team comrades in Mexico. The students donate their time and skills on this project to increase collaboration between the universities.

Once in space, the amazing AztechSat-1 will demonstrate alternative methods of satellite communication, and it will investigate new materials for protecting the electronic components internal to the spacecraft. The satellite is expected to launch during the first quarter of 2014 and be deployed from the ISS a few months later.

Mojica thoroughly enjoys his role as adviser with the AztechSat team. "It's rewarding to help undergrads explore this exciting opportunity with NASA, to collaborate with students of different cultures and to build a spacecraft that will soar into space. It's an incredible life-changing learning experience for each of us," he said.

"While SJSU has a long-standing partnership with NASA Ames Research Center, our exceptional engineering students make these partnerships thrive," added Papadopoulos. "I'm proud to say SJSU students are creative and go beyond what is expected. They're team players and top-notch problem solvers."







## NSF Grants: FUNDING A CONFERENCE, SCHOLARSHIPS AND IMPORTANT RESEARCH

THE NATIONAL SCIENCE FOUNDATION HAS AWARDED THREE NEW GRANTS TO THE DAVIDSON COLLEGE OF ENGINEERING. ONE GRANT IS FOR A MAJOR CONFERENCE THAT COULD CONTRIBUTE TO THE TRANSFORMATION OF HIGHER EDUCATION INTO THE INTERNET AGE, THE SECOND IS TO OFFER SCHOLARSHIPS TO DISADVANTAGED STUDENTS, AND THE THIRD IS TO FUND POTENTIALLY GROUNDBREAKING RESEARCH IN COMPUTER AND ELECTRICAL ENGINEERING.

### Funding an Important Conference

**The Future of MOOCs and Technology-Enhanced Learning in STEM Education**  
NSF Grant: \$50,000

“The line between online and on campus is already blurring,” reported *The New York Times* in an article entitled “The Year of the MOOC.” MOOCs (Massive Open Online Courses) are available free via the web to students anywhere. SJSU has been awarded a NSF grant for a conference to explore the role of MOOCs in STEM (Science, Technology, Engineering and Mathematics) fields. The conference will bring together faculty, administrators, MOOC providers and industries that hire STEM graduates. Conference participants will hold open strategic discussions on the role and effect of MOOCs in higher education and how they may supplement traditional and flipped STEM classrooms.

### Reducing Energy and Improving Performance in Embedded Computing Systems

**Towards Low-Latency, Low-Power Heterogeneous Memory Access**  
NSF Grant: \$100,000

Embedded computing systems are found in countless devices and applications from smart phones and digital cameras to industrial and scientific equipment. What they share in common is the need for low power consumption and high performance. This project, which has been awarded an NSF grant, explores the application of heterogeneous memory architectures to reduce energy consumption and improve performance for current embedded computing applications. The approach combines both hardware and software techniques with novel multidimensional dynamic programming to solve this complicated problem. This research may also enable more advanced computing systems such as cloud computing and exascale computing. Collaborating with leading Silicon Valley companies, the project integrates research with graduate education, both in the classroom and through direct student participation.

### Opening Worlds of Opportunity for Deserving Students

**Engineering Leadership Pathway Scholars / STEM Scholarships**  
NSF Grant: \$660,000

A college education can be out of reach for academically talented yet financially disadvantaged students—even at San José State, which is one of the most affordable universities in California. To provide opportunities for these students, the Davidson College of Engineering has been awarded a \$600,000 five-year NSF grant to fund the Engineering Leadership Pathway Scholars program and an additional \$60,000 for STEM scholarships. The goal is to increase the number of students who can complete engineering degrees and provide the next generation of outstanding talent to U.S. industry.

**FACT:** Established in 1946, the Davidson College of Engineering at San José State University is one of the five oldest public engineering programs in the state; and SJSU, founded in 1857, is the oldest public higher education institution in California.

**FACT:** The Davidson College of Engineering is the largest contributor to the Silicon Valley workforce—SJSU graduates represent the largest alumni group in companies such as Apple (3%) and Cisco (6%).

## Did you know?

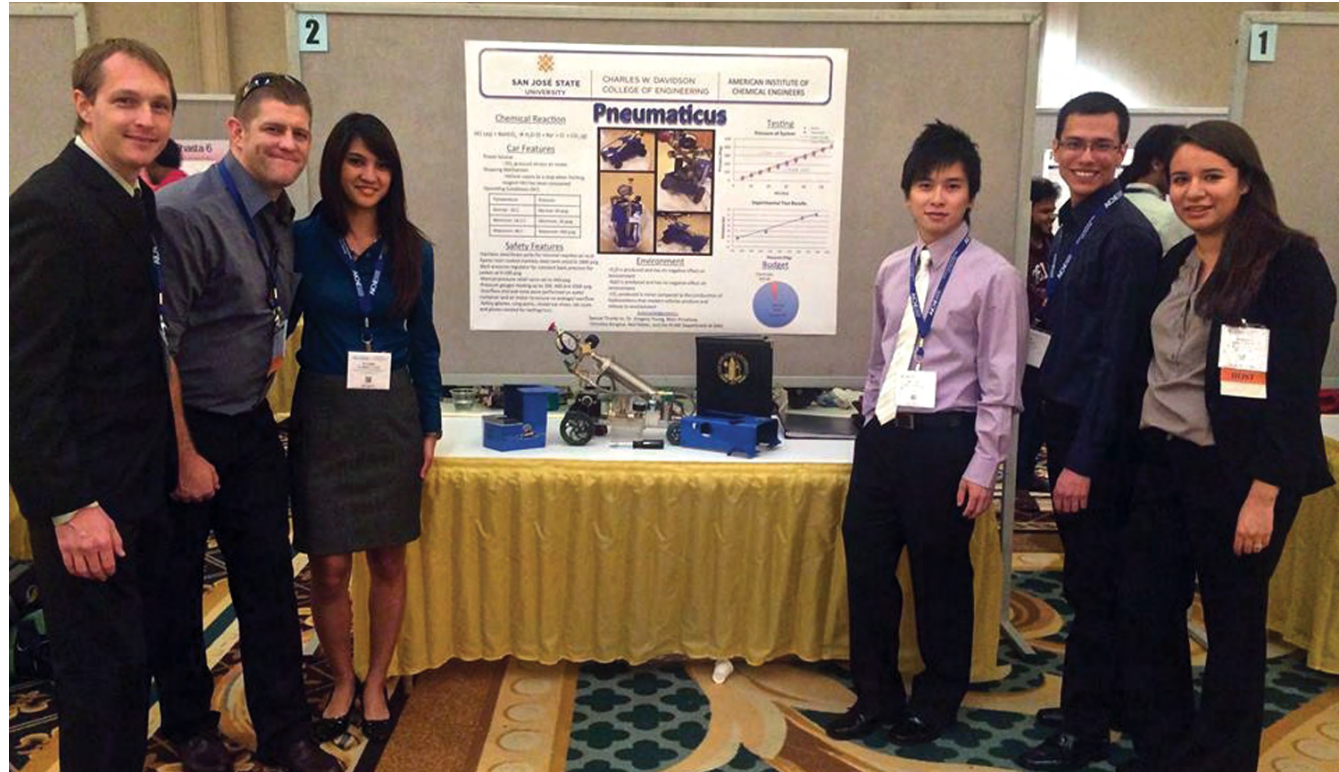
**FACT:** Ranked as Silicon Valley industry’s first choice for new engineering hires by the *Silicon Valley Business Journal* (2012).

**FACT:** The Davidson College of Engineering is one of the largest public engineering programs in California, enrolling more than 6,000 students, including 2,000 graduate students.

**FACT:** Ranked No. 2 in the nation among the best engineering programs offering bachelor’s and master’s degrees, excluding private and service universities, by *U.S. News & World Report* (2014).







## ChemE CAR COMPETITION

WHEN SJSU AICHE (AMERICAN INSTITUTE OF CHEMICAL ENGINEERS) STUDENTS ENTERED THE WESTERN REGIONAL ChemE CAR COMPETITION AT UC SAN DIEGO DURING SPRING SEMESTER, THE SIX-PERSON TEAM FINISHED SECOND IN ITS CATEGORY AND WON THE “MOST CREATIVE DESIGN” AWARD. THEY ALSO QUALIFIED FOR THE NATIONAL COMPETITION, WHICH WAS HELD THIS FALL.

It had been 13 years since AICHE students participated in a competition. However, with plenty of encouragement from their adviser, Professor Greg Young, the students accepted the challenge and ended up beating out stiff competition from Stanford and the UCs, among others. At the nationals, they were up against major universities, including some Ivy League schools. Although they didn’t win, they are more determined than ever to compete again next semester.

Unlike the Formula SAE race car, the challenge is not speed but control. The small but mighty ChemE car—so tiny its parts fit into a large shoe box—is designed to be the delivery system to control a chemical reaction a certain distance carrying a certain load (a minimum distance of 15 meters to 30 meters maximum; load range from 0 mL to 500 mL). Working over several months, the team came up with their award-winning design, an air-powered motor that runs on compressed gas.



“I’m so proud that our students qualified for the nationals. They’ve demonstrated all the traits of outstanding engineers—creativity, ingenuity, perseverance, dedication and attention to detail.”

*Professor Greg Young*

It’s engineering at its best—designing and constructing a 20-foot concrete canoe that floats. SJSU ASCE (American Society of Civil Engineers) students excel at solving this engineering puzzle and scoring high marks at annual competitions.

## ASCE CONCRETE CANOE COMPETITION

The 15-member canoe team must commit for the long haul—it takes an entire academic year and a coordinated effort to prepare for the next competition, the ASCE Mid-Pacific District Conference, April 3–5, 2014.

Chris Wong, project manager for Concrete Canoe, explained. “We start recruiting during the summer and send out funding proposals to companies asking them to

sponsor our program. Old canoes are used for paddling practice, which is one of the most competitive aspects of the competition. During fall semester, the competition rules are released and that’s when the real work begins,” he said.

This year, the team has a new challenge: researching a concrete mix design strong enough and light enough to support four paddlers without breaking. The design team tests mix designs to determine the effects of different aggregates, cements and admixtures. Typically, the mix design is buoyant and has maximum compression strength of around 2,500 psi.

“It’s been an exciting and transformative experience—seeing academic concepts at work in the real world instead of in equations or text,” Wong said.





# FORMULA SAE RACE CAR

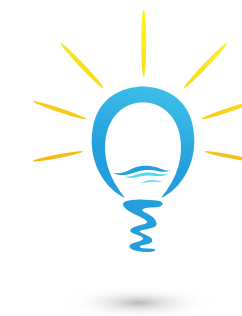
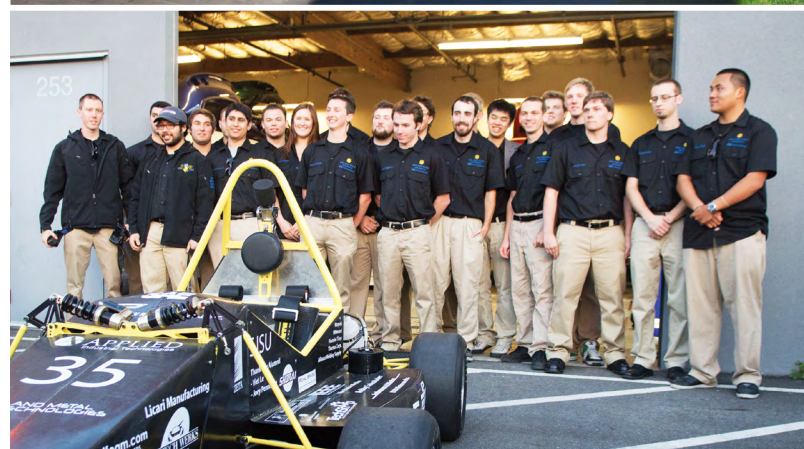
FOR FIVE CONSECUTIVE YEARS, SPARTAN RACING, SJSU'S FORMULA SAE (FSAE) TEAM, HAS MASTERED WINNING—LAST YEAR'S SR-5 VEHICLE PERFORMED EVEN BETTER THAN PREVIOUS MODELS. THIS YEAR, THE TEAM IS POISED TO RAISE THE BAR WITH ITS NEXT-GENERATION SR-6 CAR.

"The new design is shaping up to be the most impressive vehicle we've ever created," said Kevin Krakauer, vice president of Spartan Racing SAE and the team's lieutenant manager. "We expect to unveil a beautiful, lightweight SR-6 with a full aerodynamics package next April."

The 2014 racing circuit will expand from two to three competitions, including a first-ever international competition in Canada. More than 500 universities from all over the world participate in SAE's Collegiate Design Series.

The team is pulling out all the stops for the SR-6. They're using a comprehensive data acquisition system, with powerful tools and information to analyze and enhance previous systems, and state-of-the-art software for designing and correctly simulating various components on the car.

Yet, for Spartan Racing, there's something more important than winning competitions. They are engineers first—nurturing exceptional students and motivating their passion for engineering. Besides hands-on design/production activities, students are involved in materials procurement, networking with sponsors and supporters, and compiling design, cost, and marketing reports. Above all, students gain industry and leadership experience, which gives them a competitive edge in the job market.



# NATIONAL IBM CHALLENGE

## COMPUTER ENGINEERING GRAD STUDENTS WIN SECOND PLACE IN NATIONAL IBM CHALLENGE

Not all great minds think alike. Case in point: A team of three SJSU computer engineering (CMPE) grad students won second place in the recent national intercollegiate competition—The Great Mind Challenge: Watson Edition. Watson, an artificial intelligent computer system created by IBM, first gained fame in 2011 when it outperformed human opponents on the popular television game show *Jeopardy!*.

Thirty-seven university teams, including eight from SJSU, competed in the prestigious challenge. Students were asked to apply machine learning algorithms on a real dataset in order to predict the correct answers to *Jeopardy!* questions, mimicking one of the key processes that Watson runs during the game.

When CMPE Associate Professor Magdalini Eirinaki learned about the IBM challenge, she presented the five-week competition as an optional class project. Her students Soniya Hadkar, Ananya Kalugi and Ryan Alan Vo were among

those who rose to the challenge, and their dedication and hard work paid off.

"I'm extremely proud that our SJSU team, with little previous background, did such an outstanding job in this nationwide competition," said Eirinaki. "This shows that SJSU can be a serious player in big data, as we're providing students with a solid background and state-of-the-art, hands-on skills."

“We're preparing future professionals to meet the work-force needs of Silicon Valley.”

*Magdalini Eirinaki,  
CMPE associate professor*





## The Davidson College of Engineering is on the Map

Extensive outreach and partnership efforts put SJSU on Silicon Valley's target list of top schools.



For more than a decade, Associate Dean of Engagement and Extended and Graduate Studies Ahmed Hambaba has been connecting Silicon Valley's top companies with Davidson College of Engineering students and faculty—all in an effort to create lasting partnerships that benefit all. "It's a win-win-win-win," said Hambaba. "Companies keep their employees current on the latest engineering skills, the faculty sees how its curriculums are applied in the real world, students benefit from opportunities to help them along their career paths and SJSU gains increased visibility and a greater reputation for excellence."

It's an intensive, multipronged effort. But with today's fierce competition between educational institutions to attract attention—and recruiters—it's worth all the energy Professor Hambaba can spare. That's because his efforts are paying off by getting recognition of the Davidson College of Engineering as a top-tier resource by a growing number of Silicon Valley companies. And that success vastly improves the university's ability to attract high-profile faculty, students and donors, as well as its ability to participate in higher-level R&D projects.

### INNOVATIVE PARTNERSHIP PROGRAMS BRING INDUSTRY LEADERS AND THE DAVIDSON COLLEGE OF ENGINEERING COMMUNITY FACE TO FACE

The Davidson College of Engineering partnership programs provide many opportunities for students and faculty to engage with key Silicon Valley companies. Professor Hambaba networks extensively throughout the Bay Area, attending numerous workshops and conferences, and often inviting industry reps to meet with the advisory boards of the college's various departments—from mechanical engineering and aerospace to computer science. The insights he gleanes from such events help the engineering faculty tailor its curriculums to better meet the needs of a broad range of industries.

Beyond personal networking and his academic role in computer engineering, the professor has also been busy with several formal programs for keeping the Davidson College of Engineering top of mind in the Valley:

• **Applied Research Projects:** In today's business environment, companies have to do more with less. Many are outsourcing R&D projects in areas such as green energy, cybersecurity and cloud computing to the Davidson College of Engineering. By collaborating with the university, businesses gain a cost-effective and timesaving alternative to conducting exploratory research in house. And SJSU faculty and students get to hone their skills confronting technical challenges that industry faces daily.

• **Guest Faculty Program:** To keep students and faculty in touch with the latest developments, the Davidson College of Engineering has instituted a program that brings subject matter experts on real-world engineering applications into the college's labs and classrooms.

• **Master's Degree Programs for Industry:** The Davidson College of Engineering has conducted off-campus graduate curriculum programs for Silicon Valley firms since 1996. Currently, SJSU faculty teach 18 unique degree programs at companies like IBM, Cisco, HP, KLA-Tencor, Lockheed Martin and more. Participating companies benefit by keeping skill levels up to date and providing their employees with an opportunity to earn an advanced degree, while SJSU faculty advance their professional development. Additionally, the college further strengthens its relationship with industry-leading enterprises.

### THE BENEFITS CUT EVERY WHICH WAY

The outreach activities initiated over the course of the past decade have paid out rich dividends for Davidson College of Engineering students, faculty and industry partners. Students are availed of training, mentoring and internship opportunities, as well as preparation for—and often an entry into—the working world. Faculty members get to sharpen and refresh their skills and knowledge and collaborate with industry colleagues on applied research and development projects. The college receives support from generous partners for funding labs, scholarships and special programs. And local industries benefit from partnering with the largest provider of engineering brainpower to the Silicon Valley—a collaboration that delivers innovative engineering solutions focused on solving today's real-life problems.

### THE VALLEY'S TOP PROVIDER OF ENGINEERING TALENT

By partnering with local companies, the Davidson College of Engineering has elevated its profile to become a go-to resource for innovation and expertise. Today, the college is on the map and is a preferred target for businesses looking for world-class talent to partner with and to hire.

“It's a win-win-win-win. Companies keep current on the latest skills, the faculty sees how its curriculums work in the real world, students get help along their career paths and SJSU benefits from an enhanced reputation for excellence.”

Ahmed Hambaba,  
Davidson College of Engineering,  
director of External Academic Affairs

BEYOND HIS PERSONAL NETWORKING, PROFESSOR HAMBABA HAS ORGANIZED SEVERAL FORMAL PROGRAMS FOR KEEPING THE DAVIDSON COLLEGE OF ENGINEERING TOP OF MIND IN THE VALLEY.

### SILICON VALLEY LEADERS SYMPOSIUM

Since 2002, the Charles W. Davidson College of Engineering has hosted the Silicon Valley Leaders Symposium. The Symposium brings industry and government leaders on campus to talk about business, technology, competitive global economy and hiring trends. It also features prominent civic leaders who cover broader societal and political issues that shape our life and society. Recent speakers have included representatives of leading companies such as IBM, Flextronics and Juniper Networks, as well as California Lieutenant Governor Gavin Newsom and former U.S. Secretary of Transportation Norman Mineta.

The Symposium series provides students and faculty alike with an opportunity to learn firsthand how to succeed in today's highly competitive global economy. Professor Hambaba conceived the series and has been its champion since its inception. "It's more than just a lecture series—it's a networking and relationship-building partnership with organizations that will hopefully hire our graduates down the road."





# Dr. Emily Allen

## A Legacy of Student Success

From Stanford University to San José State University to CSU Los Angeles, Dr. Emily Allen is on the move.

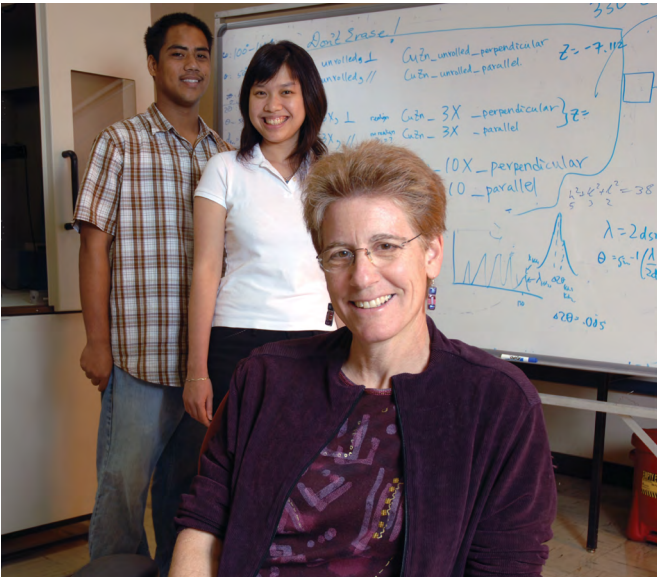
After an impressive 20-year career at San José State University, this fall, Associate Dean Emily Allen bid adieu to the Charles W. Davidson College of Engineering and headed to Southern California to serve as dean of the College of Engineering, Computer Science, and Technology at CSU Los Angeles. Allen—renowned for her passion for student learning—leaves a legacy that impacts thousands of students who are benefiting from the many STEM-related programs she established.

Hired at SJSU as an assistant professor in materials engineering in 1992 after earning her doctorate in materials science and engineering from Stanford University, Allen moved up the ranks, reaching full professor in 2003. She served as chair of the Department of Chemical and Materials Engineering for seven years and associate dean for the past five years.

“Dr. Allen was a steadfast leader in our college, a strong role model for faculty and staff members,” said Dean Andrew Hsu. “Although we miss her, we’re happy she will remain in the CSU, where she will advance the quality of engineering education throughout the system.”

“Emily is the second administrator recruited from SJSU to Cal State LA,” added Hsu. “Dr. Kuei-Wu Tsai, former chair of civil engineering and then associate dean, served as engineering dean there prior to his retirement.”

As associate dean, Allen created programs and culture changes, resulting in improvements to retention and graduation rates. She broadened the programs offered in the Engineering Student Success Center, including the MESA Engineering Program for first-generation and educationally disadvantaged students; the Women in Engineering program; and mentoring programs for both the corporate-funded Silicon Valley Engineering Scholars program and the NSF S-STEM program, Engineering Leadership Pathway Scholars. Overall, Allen managed more than \$6 million in external research and curriculum funding.



### A STELLAR EDUCATOR

Allen’s exemplary record of teaching and research in materials science and engineering included significant course, curriculum and laboratory development, including the MatE 153 Electronic Materials lecture/lab course, which thousands of undergrads have taken. She also developed two interdisciplinary research centers, the Materials Characterization and Metrology Center and the Microelectronics Process Engineering Laboratory, both of which provide research facilities for faculty, opportunities for student training and resources for more than 50 external industry users on a fee basis. She mentored nearly 50 grad students and many undergrads, a number of whom have gone on to prestigious PhD programs.

Allen established new funding for scholarship programs, a faculty professional development program for student advising and a college policy on undergraduate progress to degree. She was instrumental in advancing relationships with Bay Area high schools and community colleges to improve pathways to higher education. As director of the SJSU Engineering Pathways to Success Initiative, Allen managed more than \$1 million in corporate support for Project Lead the Way (PLTW) advocacy, summer training for middle and high school educators, and EXCEED, a summer bridge program for entering freshmen enrolling in the fall.

During her tenure as director of the PLTW California Regional Affiliate, the number of schools in the Bay Area PLTW network increased from five to 66 in five years, and summer training programs at SJSU more than doubled.

“I was always impressed with her unwavering patience, the way she listened and connected with her students, bringing out the best in them.”

Greg Young, chair of Biomedical, Chemical and Materials Engineering

# Alumni News

We want to hear from you! Do you have news about your career, education, research or avocation? Share it in a class note for publication in the *Engineering at San José State Magazine*. Future editions will feature updates from our alumni.

### SHARE YOUR NEWS

Email:  
Send news, photos and graduation year(s) to  
[engineering-alumni-news-group@sjsu.edu](mailto:engineering-alumni-news-group@sjsu.edu).

Mailing Address:  
Engineering at San José State Magazine  
Charles W. Davidson College of Engineering  
San José State University  
One Washington Square  
Engineering Building 493  
San José, CA 95192-0080

### STAY CONNECTED

Davidson College of Engineering students benefit immeasurably from the generosity of engaged alumni like you. We thank you for your continuing support.

For more information about how to make a gift, please visit [campaign.sjsu.edu/give-now.html](http://campaign.sjsu.edu/give-now.html).





CHARLES W. DAVIDSON  
COLLEGE OF ENGINEERING

San José State University  
One Washington Square  
San José, CA 95192-0080

NON-PROFIT  
ORGANIZATION  
U.S. POSTAGE  
**PAID**  
SAN JOSE, CA  
**PERMIT NO. 816**



The Davidson College of Engineering Ranked No. 2 in the nation among the best engineering programs offering bachelor's and master's degrees, excluding private and service universities, by *U.S. News & World Report* (2014).

WWW

[engineering.sjsu.edu](http://engineering.sjsu.edu)



[www.facebook.com/SJSUEngineering](http://www.facebook.com/SJSUEngineering)



[twitter.com/SJSUEngineering](http://twitter.com/SJSUEngineering)