

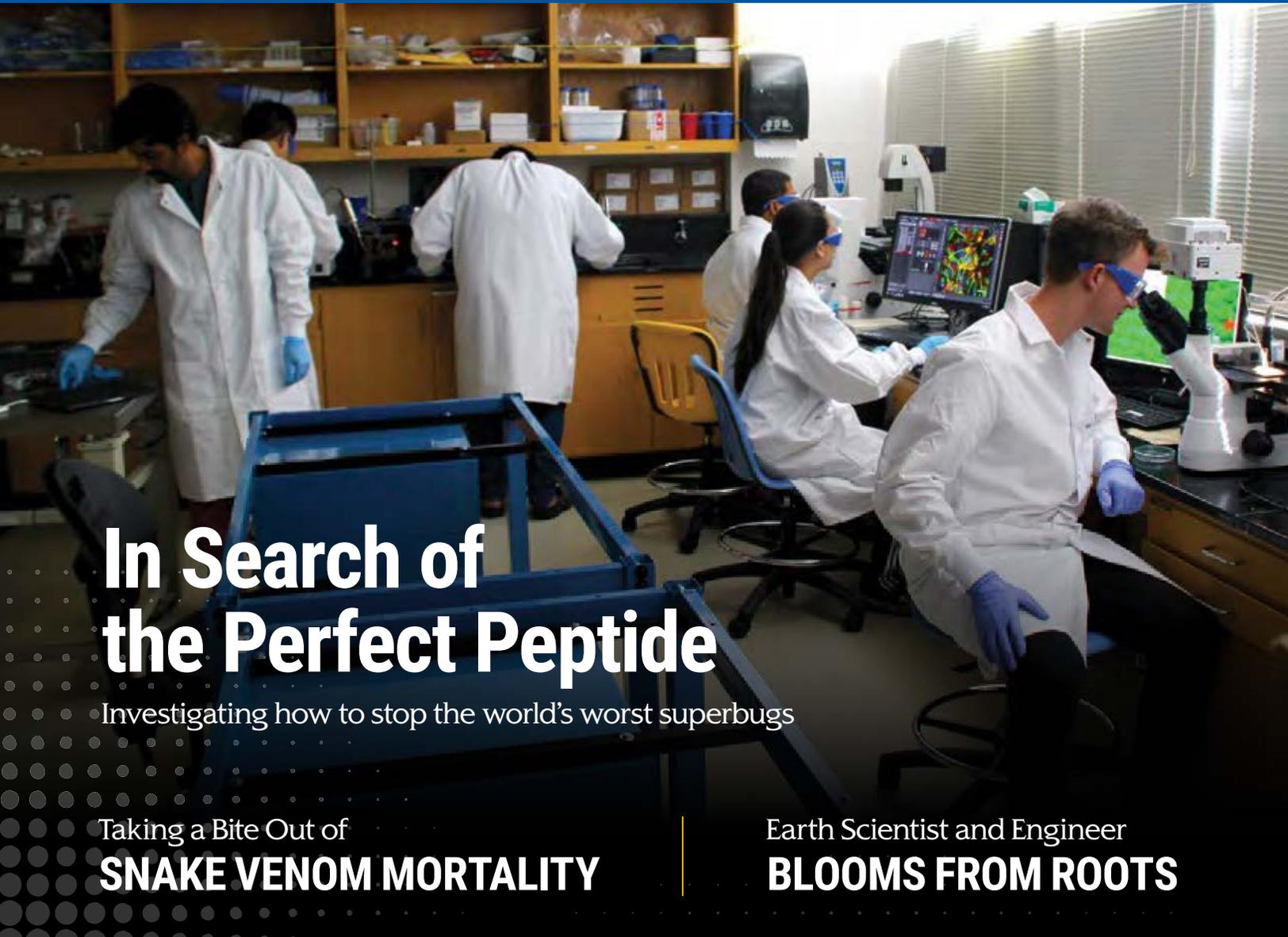
ENGINEERING

AT SAN JOSÉ STATE

CHARLES W. DAVIDSON
COLLEGE OF ENGINEERING

Fall 2018 Issue

powering Silicon Valley



In Search of the Perfect Peptide

Investigating how to stop the world's worst superbugs

Taking a Bite Out of
SNAKE VENOM MORTALITY

Earth Scientist and Engineer
BLOOMS FROM ROOTS

SJSU SAN JOSÉ STATE
UNIVERSITY

RANKED
3RD
IN THE NATION
U.S. NEWS AND WORLD REPORT
2019
See back cover

“

WE ARE BUILDING DEEPER INTELLECTUAL ENGAGEMENT.”



THERE'S A LOT OF MOVEMENT AND INNOVATION IN THE COLLEGE OF ENGINEERING THIS FALL.

We are successfully finishing a five-year strategic planning cycle, and beginning to craft our next five-year plan. We've partnered with Blue Beyond to ensure that our process will be inclusive and thorough, and that it will align with the SJSU campus strategic plan, which should be complete by the spring of 2019.

Our college produces the right kind of engineers, at the right time, in the right place. As the sole public college of engineering in Silicon Valley, we deliver the best engineering education experience at the lowest cost, facilitating the socioeconomic mobility of our students and helping diversify the technical talent in our region.

We're beginning to get our engineers out of the building and into more collaborative ventures across the campus, where they sit next to psychology majors and occupational health, business, and science majors. These new projects might look like a self-driving vehicle for elderly passengers, or an app that connects excess restaurant food to underserved citizens. We will also continue to expand hands-on opportunities for engineering students, such as our Engineering Projects in Community Service (EPICS) program.

We are also improving how we prepare our students for the workplace or their further academic pursuits. One new student engagement initiative, the GO program, made possible through generous support from the Beall Family Foundation, gamifies existing career-building extracurricular activities and enables students to find and connect with these opportunities more easily. Students are already accumulating points by building their LinkedIn profiles and attending events, and they are suggesting prizes such as money towards microcontrollers and MatLab, Arduino accessories and AutoCAD.

We are building deeper intellectual engagement, aiming for a greater fraction of our students hired into employers' leadership development programs. We want to encourage more of our students to consider graduate school, and to perhaps become a professor themselves someday. We are promoting and expanding our scholarly activities — our faculty and students are working on a range of projects, fundamental to applied.

All these are pieces of a future where Davidson College of Engineering students, faculty, staff, and alumni contribute to the development of a multidimensional interface between SJSU and Silicon Valley's innovation ecosystem. Enjoy this fall issue, and as always, I welcome your comments and ideas.

Sincerely,

Dean Sheryl Ehrman

*Don Beall Dean of Engineering, Charles W. Davidson
College of Engineering at San José State University*

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Photos (top to bottom, left to right): Hubert Abiera holds the Xi Stapler 45; Chemical engineering professor Claire Komves; Students are instructed by engineering professor Anand Ramasubramanian; Civil engineering graduate Robin Lopez.



In Memoriam: Lilly Wilderman April 22, 1949 – June 25, 2018

Lilly Yuriko Wilderman, administrative support coordinator for Mechanical Engineering, died after a brief illness in June. She is survived by her two daughters Michelle Wilderman (San Jose) and Tracy Escamilla (Dallas), as well as her sister Aimee Morimoto and Yaeko Kennelly and many nieces, nephews and friends.

Lilly grabbing pizzas for a Spartan-SAE fundraiser

Lilly grew up on a strawberry farm in Gilroy, CA. She joined SJSU in 2005 after retiring from her 35-year career in human resources at General Electric.

One of her children said at the memorial, “Family was everything to her, and the students at San José State were just more family.” Lilly helped countless students with a host of different things, from issuing permission numbers for classes to processing major forms.

Nicole Okamoto, Chair of the Mechanical Engineering department, said, “Lilly frequently stayed late to make sure that we all had what we needed. I will miss her greatly as both a colleague and friend.”

FELLOWSHIP, STRATEGY

HELPED ONE ENGINEER DESIGN DREAM CAREER



Above: Abiera holding the Xi Stapler 45, a surgical device meant to be used on several different procedures such as colorectal cancer or thoracic cancer surgery.

WHEN HUBERT ABIERA ('12 MECHANICAL

Engineering) first ventured into the Davidson College of Engineering from a microbiology track, he found much more available to him than soldering and machining. "I got a good education in engineering fundamentals," he said, "I also found friends — there were many late nights working on projects with my mechatronics team and senior design team — and ample opportunities to practice my soft skills by joining the Biomedical Engineering Society (BMES)." Every year the BMES holds a student-run conference, overseen by Biomedical Engineering Chair Dr. Guna Selvaduray. The soft skills that students gain from running the conference include learning how to talk with people in industry, staying teachable, not taking things personally, and learning how to promote one's self without arrogance.

Like many SJSU students, Abiera faced the challenge of being a commuter student, devoting a chunk of each day to travel and carrying everything he needed with him. In addition, he was living with an illness that presented physical symptoms to be endured and overcome by mental fortitude. "Many times the thought of slowing down came to me, but it didn't feel like a viable option if I wanted to become an engineer," he said. Rather than letting these

AND DRIVE

“The mechanical puzzles that keep me up at night are the same things that make me want to go to work in the morning.”

challenges overwhelm him, Abiera methodically gathered information, set goals for himself, figured out strategies, and then set to work hitting his own personal milestones.

One of the key components of his school career was working at three different internships, the experience of which informed the next decade of his life. “Having a lot of exposure to industry while in school made me successful,” he said. “Getting internships at Delphon and Plantronics helped me figure out that not every engineer will become a designer right out of college. A lot of engineers end up in quality roles where they check design output, or manufacture the tools that make the part, not the part itself. I did want to become a designer, so I realized that I had to strategically focus on certain school courses to become a better fit for that role, and let other things go.”

Abiera set his sights on one particular company, Intuitive Surgical, Inc., and worked on developing qualities that would be attractive to Intuitive Surgical. Ranked #5 on Fortune’s “Future 50” list, the Sunnyvale, CA company develops, manufactures, and markets robotic products designed to improve clinical outcomes of patients through minimally invasive surgery, most notably with the da Vinci Surgical System. “I made sure I was super solid on my technical fundamentals. I also set out to work on my confidence level. I knew I needed to promote myself without looking like a jerk. I had to show them I was good and had the skills.”

“My dad always told me, ‘Everybody gets their shot. It’s up to them to be ready.’” Abiera’s father had been a general manager when he moved the family to the

United States from the Philippines in 2000. He began his American career as an assembler on a factory line, and has since worked his way up to become a national sales manager for a Hayward tech company.

Abiera interviewed with Intuitive Surgical right out of school and they hired him – but not as an engineer. “Intuitive Surgical was the top of my list, and I didn’t care what position I took, I just knew I had to get in.” Within five months, the opportunity came for him to promote his skills, and he became an NPI Manufacturing Engineer, which later led to the opportunity to become a Mechanical Design Engineer.

At Intuitive Surgical, Abiera uses some of the fundamentals he learned at SJSU in his daily work. “I still use the software skills that I learned in my Mechatronics class, too,” he said. He is passionate about his work at Intuitive Surgical. “We face mechanical challenges because we are pushing boundaries. These challenges reverberate throughout my day and I try to solve them – that’s part of being a good engineer. The mechanical puzzles that keep me up at night are the same things that make me want to go to work in the morning.”

And perhaps as no surprise, he has a new set of goals. “I need to increase my versatility, so I can understand the full picture of our product creation; some of the colleagues I admire most are versatile. I want to be able to mentor younger engineers, to foster good teams. A strong team is where the members can each do a bunch of things almost as well as you can. That makes each member a strong asset.” Once again, Abiera is looking ten years ahead, setting his sights, and planning a winning strategy. 🍷

Editor's note: The following two stories highlight our Chemical and Materials Engineering department, which has recently become its own department again, after combining with our Biomedical Engineering department for several years.

In Search of the **PERFECT**

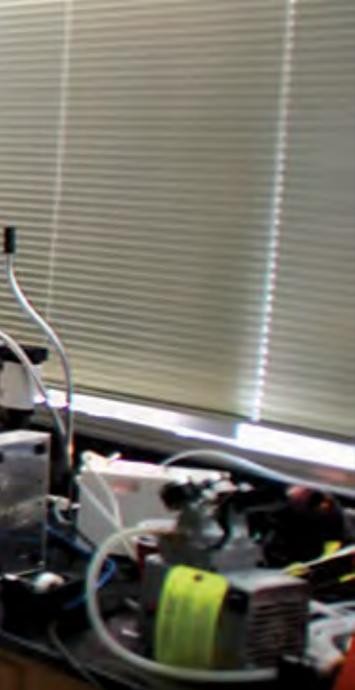
ANTIBIOTIC RESISTANCE IS ONE OF THE MOST

difficult problems society faces today. According to the Centers for Disease Control and Prevention, the upward shifts in nosocomial (hospital-acquired) infections from all types of microorganisms are a significant and growing threat to human health due to their recalcitrant and increasing antibiotic resistance. In particular, methicillin-resistant *Staphylococcus aureus* (MRSA) is a major cause of morbidity and mortality in nosocomial infections. Over the past 30 years, the search for new antibiotics from natural or synthetic small molecule libraries has met with very limited success. But what if the world's worst superbugs could be stopped by a humble antimicrobial peptide found in soil, or even sewage?

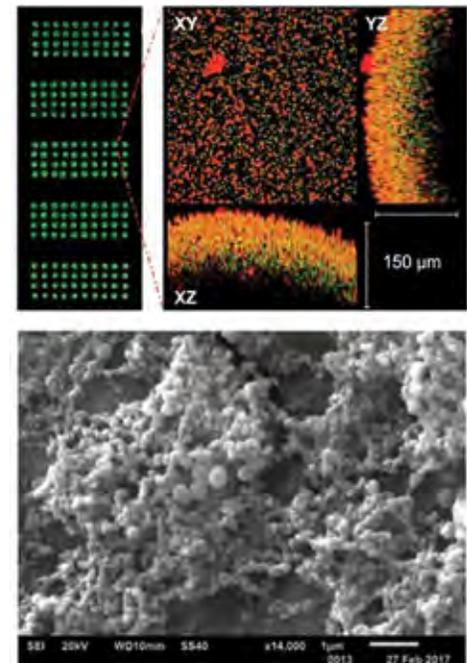
SJSU chemical engineering professor Anand Ramasubramanian and his collaborators have just received a research grant from the National Institute of Health to investigate that possibility. "Instead of indiscriminately killing bad and good bacteria using traditional antibiotics, to which bacteria are intelligent enough to adapt and evolve around, what else can we do?" queried Ramasubramanian. "A lot of nasty infections are caused by biofilms, which is essentially

a gooey cement that bacteria and fungi create to colonize the host. The biofilms are what we can see in moss growing on ships, or mold spreading across bread. In really nasty cases, we see white thrush or *Candida* infections, or *Pseudomonas* infections that destroy human lungs. Deadly MRSA colonize and grow as biofilms, and are hard to treat. What if we could prevent bacteria from making that gooey cement, by simply weakening their ability to colonize, thus stopping biofilm growth, but not killing them? The advantage to that approach is that we may save the good bacteria, such as those found in your gut, which are essential for your well being."

"The next question is, where do we search for compounds that can have the desired effect?" asked Ramasubramanian. Because DNA is indestructible, we know that in soil, sewage, and fecal matter, proteins degrade and bacteria die, but DNA does not. Everything that bacteria produce is encoded in their DNA. "We think that peptides with antimicrobial properties may be efficiently isolated from DNA libraries created from soil, human and/or animal microbial communities," said Ramasubramanian. That's because soil and sewage are rich in bacterial communities and they may be



“What if we could prevent bacteria from making that goeey cement, by simply weakening their ability to colonize, thus stopping biofilm growth, but not killing them?”



A nanobiofilm chip (nBioChip) of *S. aureus*. The biofilm spots are interspaced at 1 mm with a diameter of 500 μm . Fluorescence micrographs of a single spot of *S. aureus* nanobiofilms stained with SYTO-9 (in green, binds to biofilm matrix) and SYPRO Ruby (red, shows cells) in 3D. SEM micrograph of *S. aureus* nano-biofilm colonies.

PEPTIDE

producing compounds that help in the survival of some while acting against others. Ramasubramanian is seeking compounds that will act against bad bacteria like MRSA. One of his colleagues from Washington University, Dr. Gautam Dantas, takes soil and sewage from various locations, chops the DNA into pieces, puts the pieces into bacteria, and then grows the bacteria to express the DNA to produce ‘metagenomic libraries’ that encode for different compounds the original bacteria could produce. Since each bacterium may receive only one piece of DNA, one of these millions of clones could contain the gene that produces a goeey cement-prevention antibiotic.

“The third question is, how do we look for this needle in a haystack of millions and millions? Traditional methods of using well plates or shake flasks are inadequate for this job. Fortunately, we have a tool for that ultra-high-throughput analysis,” he said. “We’re using a novel ultra-high-throughput nano-scale cellular microarray.” In fact, Ramasubramanian is the creator of that tool, a 3D-printed slide looking somewhat like a spice grater with 50-nanoliter spots on one side. The nBioChip is robotically printed, robustly handled (that is, washed in a series of baths), and scanned using

a standard microarray reader. Using this technique, hundreds to thousands of identical nanobiofilms encapsulated in hydrogel spots are cultured on microscope slides. The spots can withstand the washing steps involved in screening assays.

“Specifically, we will develop a ‘library on a chip’ consisting of bacterial clones containing DNA pieces that express an encoded compound such as a peptide on one slide, and another ‘pathogen on a chip’ containing all MRSA biofilms,” he said. When SJSU lab assistants chemical engineering student Richard Tiongco or postdoc trainee Amit Saha expose the MRSA chip to the metagenomic library chip, they can identify the clones that stop the growth of MRSA biofilms. In this way, they can screen millions of samples searching for that one peptide effective against MRSA biofilms within as little as a month.

This platform, says Ramasubramanian, of combining metagenomics with ultra high-throughput screening for novel peptides can be used not only for antibiotic discovery, but also for a wide range of biomedical applications in processes that could save countless lives. ☺

TAKING A WICKED BITE OUT OF SNAKE VENOM MORTALITY

CHEMICAL ENGINEERING PROFESSOR CLAIRE

Komives has dedicated her research to developing a broad-spectrum snake antivenom that could potentially save many lives. Though the lethal strike of a snake is not a common worry for the average American (unless they live in rattlesnake or copperhead territory), an estimated 125,000 deaths due to snake bites still occur in India, Southeast Asia, and parts of Africa every year. “It’s a terrible, painful death, and it often afflicts the breadwinner in the family, since they’re the one out working in the fields or coming home from work in the nighttime,” Dr. Komives told *Chemical and Engineering News* in May.

Komives had stumbled on a news story about a protein in opossums that makes the animals immune to snake bites. A Texas-based researcher had traced this immunity specifically to the protein’s N-terminal 10 or so amino acids, creating and patenting a peptide from that sequence.



A protein unique to opossums could save thousands of lives.

Komives took this research further during her time spent at the Indian Institute of Technology, Delhi with a Fullbright fellowship, where she witnessed firsthand the extreme poverty afflicting much of the population. Determined to make a difference, she helped to develop a lower-cost method for producing the peptide, potentially making antivenom more affordable for the fieldworkers that are most vulnerable.

Recent research has shown that it also completely protects mice from the venom of two deadly species of snakes in Africa. Komives and her colleagues estimate that it would cost only about 10 cents per dose to make this antivenom.

Next, she is tackling the limitations in the current method of antivenom synthesis; all current treatments must be administered at a hospital and are produced in horses.



Above: Komives on a rickshaw. Left: Komives and her research group at IIT in Delhi

Her proposed solution is the very peptide she synthesized, chemically modified into a universal antivenom that could be applied in an immediate fashion similar to an EpiPen(R).

Her graduate student assistant, Israel Juarez Contreras, won first place in the CSU Student Research Competition this spring with his research entitled “Expression of Snake Antivenom Peptide Chain in *Pichia Pastoris*.” Both Komives and Contreras were supported by a Kordestani–endowed Research Professor award during 2017.

With ten undergraduates working with her at SJSU over the summer, Komives is developing a new compound that neutralizes the neurotoxic effects (paralyzing the victim) of snake bite venom. “It looks promising,” she shared. Two of the students are still working with Contreras and Komives on the project, and, she said, “we are making progress.”

The team may test it in pets. Each year, 100,000 cats and dogs in the U.S. get bitten by the family of snakes that includes rattlesnakes and copperheads. “Even if the peptide itself is not the magic bullet, the combination of our new compound and the peptide could be the basis of a universal snakebite treatment.”

An SJSU alumna who earned her PhD at University of Pittsburgh, Komives has taught at SJSU since 1999. She was a past chair of the American Chemical Society Biochemical Technology. She is deeply enthusiastic about both teaching and her research at SJSU, because as she says, “We are doing research that can make a difference.” 🍷

NEW FACULTY

We are pleased to present the new faculty members of Fall 2018

Joining the Davidson engineering family, our newest faculty members bring diverse intelligence and passion for education. Some of their areas of research include: renewable energy, earthquake reconnaissance, security and privacy of biometrics, autonomous multi-robot systems, simulation and modeling of novel transistors, metamaterial design, and smart structures.



LUCIA CAPDEVILA

Assistant Professor,
Aerospace Engineering



DAVID WAGNER

Assistant Professor,
Chemical Engineering



WILLIAM GREENWOOD

Assistant Professor,
Civil & Environmental Engineering



NIMA KARIMIAN

Assistant Professor,
Computer Engineering



MAHIMA SURESH

Assistant Professor,
Computer Engineering



WENCEN WU

Assistant Professor,
Computer Engineering



HIU-YUNG WONG

Assistant Professor,
Electrical Engineering



FATEMEH DAVOUDI

Assistant Professor,
Manufacturing Systems



FERUZA AMIRKULOVA

Assistant Professor,
Mechanical Engineering



AMIR GHAZANFARI

Assistant Professor,
Mechanical Engineering

As seen on SOCIAL MEDIA



#SJSUEngineering

Sky Eurich and Shivangi Agarwa are just two of the many students at #SJSUEngineering participating in active research. In Dr. Francesca Favaro's aviation lab, they're able to assess the safety and risk associated with autonomous systems. Yesterday, at a legislative meeting, the three presented their research efforts and explained the positive impacts it has had on their personal, professional and academic lives. Go Spartans!



#SJSUEngineersWeek

"The moment I wanted to become a Biomedical Engineer was when I tore my ACL. The idea that a machine can create such a detailed image of my own soft tissues and bones to help visualize the severity of my tear immediately peaked my interest in the growing field. As I inch closer to graduation, I'm more thankful of the path I chose and the connections I've made."

#SJSUEngineering

Congratulations to Spartans Wilton Chang, Matthew Le, Aditya Mairal, Austin Stevenson and Suraj Thapa! They won first place in the HVAC Design Calculations category at the 2018 ASHRAE Winter Conference, designing a single-story meteorological station in the Diego Ramires Islands, Chile.



#SJSUEngineering

#SJSUEngineering put its best face forward this past weekend to welcome newly admitted Spartans! Thank you to everyone who volunteered and participated!

#SJSUEngineering

Did you spot #SJSUEngineering in the news last week? Last semester it was reported that rising house costs had left English professor Ellen James-Penney and her husband homeless. Now, a team of industrial tech students are working on converting an old school bus into a livable space for the James-Penneys!



#SJSUEngineering

Proud of our Spartans! #SJSUEngineering

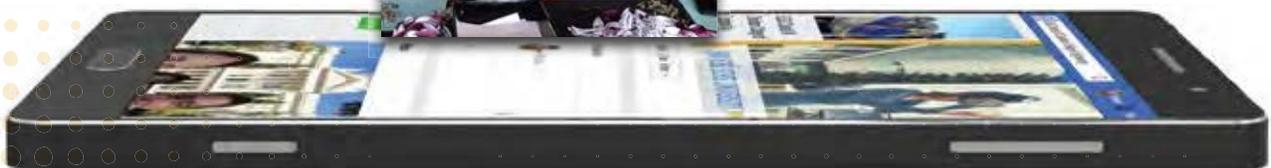
#SVWIE2018

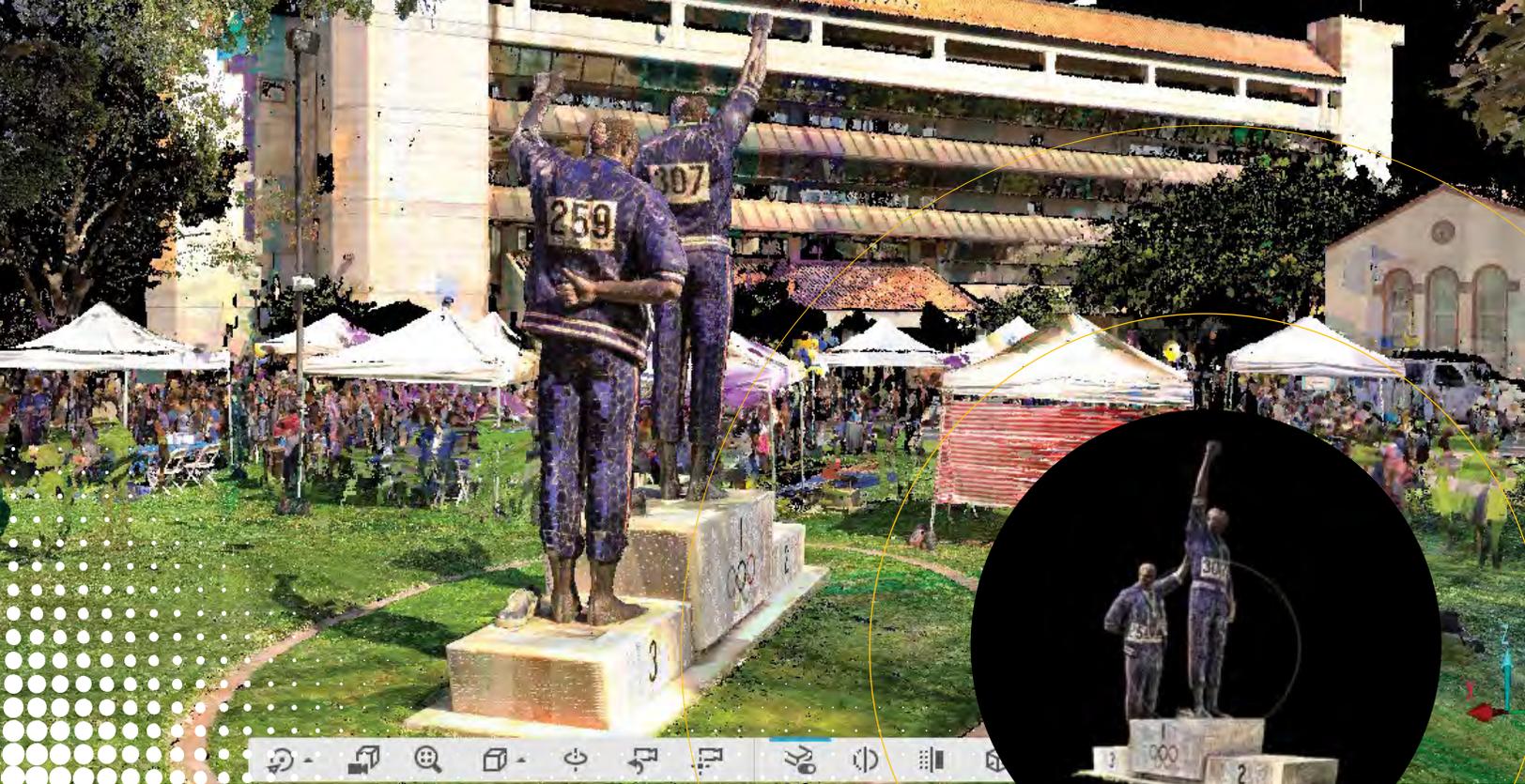
Today's the day! Our much-anticipated Silicon Valley Women in Engineering Conference kicks off with a great registration team, a full house, and keynote speaker Maggie Johnson (VP of Education, University Programs at Google). #SVWIE2018



#SJSUEngineering

Summer is for studying abroad! Eight #SJSUEngineering students are currently in Taiwan learning about the global economy and working on creating an innovative product through the Global Tech Institute Program. We can't wait to see what they come up with! Students: Cole Green, Tu Pham, Chelsea Jaculina, Leo Jin, Roman Mateo, Lesslie Verduzco, Pranit Ravurir, and Karen Tan.





Photos courtesy of FARO Technologies and Chris Brown, using the FARO S350 scanner.

TAKING “REALITY CAPTURE” LASER SCANS OF HISTORY

AS PART OF THE ANNUAL SPARTAN WEEKS OF

Welcome, Christopher Brown, who has been a part-time lecturer for Civil and Environmental Engineering Associate Professor Jae Peyon, demonstrated 3D-laser scanning of the Olympic Statue of John Carlos and Tommie Smith, in front of the Clark building.

Brown also works at Faro Technologies, which creates scanners and software for construction, engineering, historical preservation, facility management, and AR/VR applications. “We did a total of 7 scans and achieved an accuracy of .256 in for the entire point cloud,” said Brown. “I archived the scans using WinRAR.” Reality capture technology, laser scanning/photogrammetry, is also used in myriad disciplines and vocations outside of the engineering and building fields, including animation, archaeology, and forensic investigation.

The timing of the scan was propitious. Fifty years ago, Smith and Carlos were SJSU track and field team members when they qualified to compete in the 1968

Olympics, held in Mexico City. After earning gold and bronze medals, respectively, they chose to bow their heads and raise gloved fists on the medal stand while the national anthem was played. In doing so, they created their iconic moment in athlete activism during one of the most tumultuous times in modern U.S. history.

This year, SJSU will commemorate that moment with a number of events, and has announced that Smith and Carlos have been named this year’s recipients of the university’s highest honor, the Tower Award. “San Jose State University alumni Tommie Smith and John Carlos felt the fate of the nation resting on their shoulders when they made their unforgettable statement in support of human rights and dignity,” President Mary A. Papazian said. “As SJSU marks the 50th anniversary of their courageous act, we seek to recognize these alumni for risking everything to bring worldwide attention to the defining issue of their time, one that still resonates today.” 🌟

ALUMNI NOTES



MEETA ROY

BS Electrical Engineering '03



Roy's new clothing line, **MERORA**, is an apparel and accessories brand reclaiming the word *geek*. "I created this line to encourage a culture of innovation, advocacy, and activism," said Roy, "with designs ranging from celebrating women in tech, to advocating for equality and rising up together, to promoting inclusion and diversity in STEM fields. MERORA wants you to wear it loud and wear it proud that you are a geek! A portion of the profits goes to organizations that support the advancement of education in STEM fields." Find out more at www.merora.com.

THOMAS ESQUEDA

BS Civil Engineering

Recently appointed as Fresno State University's first associate vice president in Water and Sustainability. He will be resigning as the city of Fresno's Department of Public Utilities director, a position where he was leading the city's \$429 million "Recharge Fresno" effort to upgrade pipelines and water systems.

CHANDRAKANT DURLABHBHAI PATEL

MS Mechanical Engineering

A HP Senior Fellow and Chief Engineer, was recently recognized by the National Academy of Engineering for his contributions to the thermal sciences field, particularly in data center thermal management design. Mr. Patel has also served as adjunct faculty at SJSU teaching thermal management. He is a Fellow of the American Society of Mechanical Engineers, and a Hall of Fame Award recipient from the Silicon Valley Engineering Council.

RUPEN SHAH*BS Electrical Engineering '91*

With more than 25 years' experience in the industry, he has been named the Vice President of Independent Software Vendor Alliances and Strategy of Pegasystems Inc.

ANDREW PENG*MS Electrical Engineering*

During his time here at SJSU, he was an instructor for digital and analog engineering lab courses for the College of Engineering. He has recently been named the vice president of Business Development for the Greater China region for Spin Transfer Technologies, Inc. He was previously the chief strategy officer and vice president of Business Development of North American and European operations for Tongfu Microelectronics Co.

NANCY WHEELER-NELSON*BS Electrical Engineering '79*

Retired General Manager of Trimble, where I was able to work on many early GPS applications that are now everyday utilities. I have also been a Society of Women Engineers Fellow member and founding co-director of GetSET, the 28 year-old outreach program for high school girls. Now retired, I look forward to saying "yes" to the interesting possibilities of encouraging new engineers and makers.

IN MEMORIAM

"He was one of our really humble nontraditional students; he really worked so hard to make this graduation."

RICHARD NEWTON HERRIN*February 23, 1964 - May 26, 2018*

An army vet and machinist by trade, husband, father and grandfather, Richard Herrin began college in 2010 on a mission to become an engineer. After eight years of study, this May, Richard graduated from the SJSU College of Engineering with honors, with his Bachelor of Science in Industrial Technology and Manufacturing. Two days later, he was surfing when he passed away.

Nima Abrishamkar, administrative analyst in the Aviation and Technology Department, said, "He was one of our really humble nontraditional students; he really worked so hard to make this graduation. He was president of honorary Epsilon Pi Tau student chapter and helped out during their last initiation." In June, friends and family held a scattering of ashes and paddle-out at 38th Avenue in Santa Cruz, a surfer farewell.

JAMES "GREG" GREGORY NUTTLE*August 17, 1957 - May 31, 2018*

A life-long California native, Greg enjoyed much of the state's natural wonders through his time as an Eagle Scout, river rafting guide, lifeguard, extreme backpacker, professional tennis player, and a sailor in the Lake Tahoe Windjammers Yacht Club. He graduated from SJSU with a degree in Aeronautical Engineering and went on to be a Professional Ski Patroller for 30 years. In addition to his adventurous titles, he was also a beloved father, grandfather, brother, uncle, mentor, and friend.

UPCOMING EVENTS

Silicon Valley Leaders Symposium

Thursdays at noon | ENG 189

The Symposium hosts industry and technology leaders to talk about business and technology trends. It also features prominent leaders who discuss broader societal and political issues that shape society.

GreenTalk Speaker Series

Wednesdays at noon | ENG 189

Practicing engineers, scientists, and technical experts deliver up-to-date briefings on how engineers deal with environmental issues.

Dean's Career Conversations

Days and times vary | ENG 494

Dean Sheryl Ehrman and select students enjoy dinner and conversation with alumni and other mentors from a variety of engineering fields.

Fall Commencement Ceremony

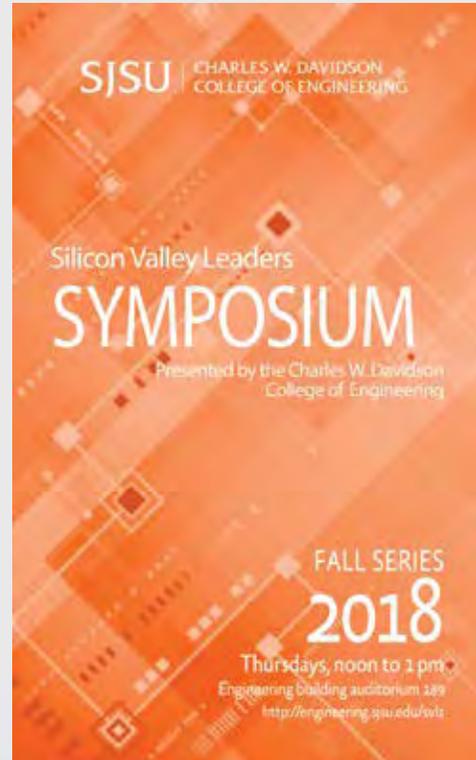
December 20th, 2018 | Event Center

5th Annual Women in Engineering Conference

Saturday, March 16th, 2019 | Diaz Compean Student Union Ballroom

Engineering Awards Banquet

May 2nd, 2019 | Diaz Compean Student Union Ballroom



SHARE YOUR STORY

Share your updates with Engineering at San José State!

Fill out the form below, snap a picture and email to: engineering-comm@sjsu.edu

NAME: _____	MY UPDATE IS: _____
MAJOR: _____	_____
GRADUATION YEAR: _____	_____
EMPLOYER: _____	_____
JOB TITLE: _____	_____
CITY/STATE: _____	_____
EMAIL: _____	_____

EARTH SCIENTIST AND ENGINEER BLOOMS FROM RICHMOND ROOTS

NEWLY MINTED MASTER OF CIVIL ENGINEERING

Robin Lopez ('18) is taking his academic talents to U.C. Berkeley, as he has been accepted to Cal's top-ranked PhD program for Environmental Science, Policy, and Management. If one were to examine who Lopez is on paper, his admittance comes as no surprise; his curriculum vitae boasts a long list of scholarships, publications, professional associations, and even a Presidential Service Award. Since 2012, he has been working for the U.S. Department of Energy's Lawrence Berkeley National Laboratory, where he started as an intern and is now a research associate investigating the effects of climate change via Arctic permafrost analysis. And, most recently, he was granted a coveted NSF Graduate Research Fellowship. But, accolades and accomplishments aside, the most compelling part about him is the story behind it all.

Lopez grew up with eleven siblings in a low-income household in a California city known for its high crime rate and violence. In an environment where funerals and incarcerations were the norm, the future looked bleak.

"Survival becomes the priority," said Lopez. "I had ambitions and dreams but my motivation was low. This led to some self-destructive habits during my high school years because I didn't think I would see the age of eighteen."

The suicide of his best friend forced Lopez to finally reevaluate the path he was on and catalyzed him to change. He decided to pursue engineering, a field he had been interested in since childhood. As a young boy, he frequently accompanied his mother on long work commutes across the San Rafael-Richmond Bridge, allowing him to marvel at its ingenuity and contemplate the very real role engineering plays in everyday life.

He went on to earn an Associate's degree at Contra Costa College and a BS in Civil Engineering from San



Photo by Paul Mueller

Francisco State University, and immediately set his eyes on graduate school. When met with rejection letters, though, he opted to enroll in Open University courses at San José State University to boost his GPA. This small detour turned out to be most rewarding; he credits the Davidson College of Engineering and several of its Civil Engineering faculty members — Professors Wen Wang, Bassam Kassab, Juneseok Lee, to name a few — as the reasons he was able to both successfully pursue his Master's and prepare for PhD-level work.

"When I arrived," said Lopez, "I thought to myself, 'This is where I want to be.' I felt very comfortable at SJSU. Not only were the courses intellectually stimulating, the inclusion and diversity I saw was nothing like I've seen anywhere else and anytime I had an issue, a professor was there ready to help."

After earning his doctorate, Lopez's goal is to offer that same professorial support to future CSU students and to mentor at-risk youth. Currently, he participates in a summer program called Metas, where he teaches 4th and 5th graders earth science through hands-on demonstrations and educational hip-hop songs he pens himself. Many of his students are growing up in the same Richmond that he knows all too well, but this only energizes Lopez even more to action.

"I have a story that resonates with them and this can be a powerful tool to facilitate change in their lives. My advanced degrees and NSF fellowship are not just an investment in me, but in these students who might otherwise not be reached."

For anyone interested in learning more, Lopez provides updates on his research, outreach, and activism at www.robindlopez.com. ☺

RANKED **3RD** IN THE NATION BY U.S. NEWS AND WORLD REPORT **2019**
Among public engineering programs offering bachelor's and master's degrees, excluding service academies.



Do you know an outstanding Spartan Engineer?

Why not nominate her/him for our Distinguished Alumni Award?

This alumnus or alumna has achieved superior professional accomplishments and/or has demonstrated outstanding citizenship through significant community or professional service.

The Distinguished Alumni winner receives:

- ✓ **Complimentary seats (2)** at the dean's VIP table at the awards banquet
- ✓ **Plaque** displayed in the college and one to keep
- ✓ **Website recognition**

Self-nominations are accepted. Go to: bit.ly/SJSUengrDA. Our form is open through February 2019.