

ENGINEERING

AT SAN JOSÉ STATE

CHARLES W. DAVIDSON
COLLEGE OF ENGINEERING

powering Silicon Valley

Getting To Know

DEAN SHERYL EHRMAN

Making the City

SMARTER AND SAFER

Alumni Braves the Depths:

ROBOT EXPLORERS

Studying Saturn by

RADIO SIGNAL

SJSU SAN JOSÉ STATE
UNIVERSITY



“

**MY GOAL IS TO PREPARE
OUR STUDENTS FOR WHEREVER
THEY WANT TO GO NEXT.”**



ON THIS LAST TRIP, MY FOURTH CROSS-COUNTRY DRIVE, WE ARRIVED in San José just in time for the July 4th celebration. After 3,500 miles across fifteen states, plus the District of Columbia, I was reminded of a statement made by Dr. Vivek Murthy, the former U.S. Surgeon General, who said “America is promise we have made to one another.”

As to how I got here, my family and dog and I could have easily flown out, and we could have had the car shipped instead of driving. But the lure of the open road and of seeing new things was too powerful.

As we pulled into Sioux Falls, SD at lunch time, my daughter Camila requested Asian food. My stereotyping mind assumed that we wouldn't have a lot of good options. Turns out, after looking on Yelp, there were many good options, and we enjoyed some of the best Vietnamese food I have ever tasted, thank you Lam's Restaurant.

A poster on the counter at the restaurant was advertising interpreter jobs at the Multi-Cultural Center of Sioux Falls, languages: Amharic, Tigrinya, Arabic, Somali, Nepali, Spanish, Dinka, Oromo, and Bosnian.

In diversity of experience, we always find strength. That's why I was so strongly drawn to the Deanship at the Charles W. Davidson College of Engineering. The diversity of our students is America's promise of different perspectives banding together to solve our most challenging problems.

Rooted in the Spartan tradition, yet agile enough to greet the future, my goal is to prepare our students for wherever they want to go next.

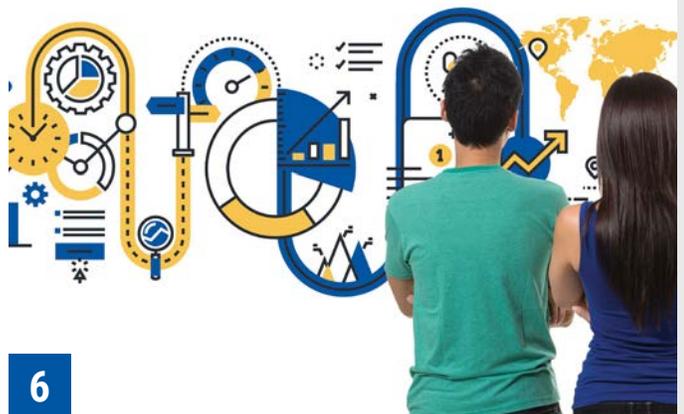
Sincerely,

Dean Sheryl Ehrman

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): Dean Sheryl Ehrman with her dog; Students work with data analysis to make San José safer and smarter; Associate Dean Essam Marouf analyzes radio signal from Saturn; Alumnus Eric Stackpole holds an underwater robot.

Front Cover: Dean Sheryl Ehrman and MS Software Engineering student Rajath Swaroop ('18) discuss a mobility project with a prospective student during Fall Preview Day.

Getting to Know DEAN SHERYL

DR. SHERYL EHRMAN WAS APPOINTED AS DEAN OF THE CHARLES W. Davidson College of Engineering in July 2017.

Ehrman previously served as Keystone Professor and Chair of the Department of Chemical and Biomolecular Engineering, at the University of Maryland, College Park, since 2010. She began her faculty career there in 1998. As chair, she oversaw an expansion of tenure-track faculty, development of two new BS/MS programs, the growth of transfer student pathways, initiation of a multidisciplinary research center for advanced battery technology, and development and implementation of strategies to engage alumni and industry partners.

California is not new to her; in fact, she feels as though she is returning home. She received a Bachelor's in Chemical Engineering from UCSB and

*Below left: Dean Ehrman at Fall Preview Day.
Right: Dean Ehrman with her dog, Emme.
(Photo courtesy of David Schmitz.)*



... a passion for research, a proven ability to create industry partnerships and an aspiration to foster a diversity of ideas.

EHRMAN

went on to complete a doctoral degree in Chemical Engineering in the major field of Aerosol Science and Technology and the minor field of Atmospheric Science at UCLA. She is a licensed professional engineer in the state of Maryland.

Ehrman served as a visiting scientist with the National Institute of Standards and Technology, in Maryland, and as a National Science Foundation-sponsored post-doctoral fellow at the Paul Scherrer Institute, in Switzerland. In 2006, she was named a Fulbright Scholar and visiting associate professor at the Indian Institute of Technology, Bombay, where she engaged with students and faculty in the Department of Chemical Engineering. She served as a Fulbright Alumni Ambassador from 2013-16.

During the search process, Ehrman expressed a passion for research, a proven ability to create industry partnerships and an aspiration to foster a diversity of ideas. Most importantly, she possesses the skills to build student engagement and support student success at SJSU.

Read her Message from the Dean on the inside cover. 📖



MAKING THE CITY SMARTER AND SAFER



Center for Smart Technology and Computing

FACULTY AND STUDENTS WITHIN A NEW CENTER

of Excellence in the Davidson College of Engineering may find solutions that have positive impact on smart campuses, smart cities, smart environments and smart life-and-healthcare services.

The center for Smart Technology and Computing for Complex Systems (STCC) enables multidisciplinary research projects to address engineering applications that relate to complex cyber systems such as smart sensing, Internet of Things (IoT), big data computing and service systems engineering.

Associate Dean of Research, Essam Marouf, said, “The college’s efforts to promote research are heading in the right direction with the Centers of Excellence, where cutting-edge topics translate theory into practice. They validate the vision of our Dean. Student participation in research is something the college really cares about. San José State will soon be better known and appreciated not only for excellence in teaching but also its scholarly work and research.”

“San José State will soon be better known and appreciated not only for excellence in teaching but also its scholarly work and research.”

Advisors include academic and industry heavyweights from as far as Australia. Led by Dr. Jerry Gao, Professor of Computer Engineering, and Dr. Alessandro Bellofiore, Assistant Professor of Biomedical, Chemical and Materials Engineering, the multidisciplinary team includes researchers in engineering, business, science, and economics. The center has so far received nearly \$400,000 in grants from the Department of Defense, National Science Foundation, and Huawei.



for Complex Systems already at work with the City of San José

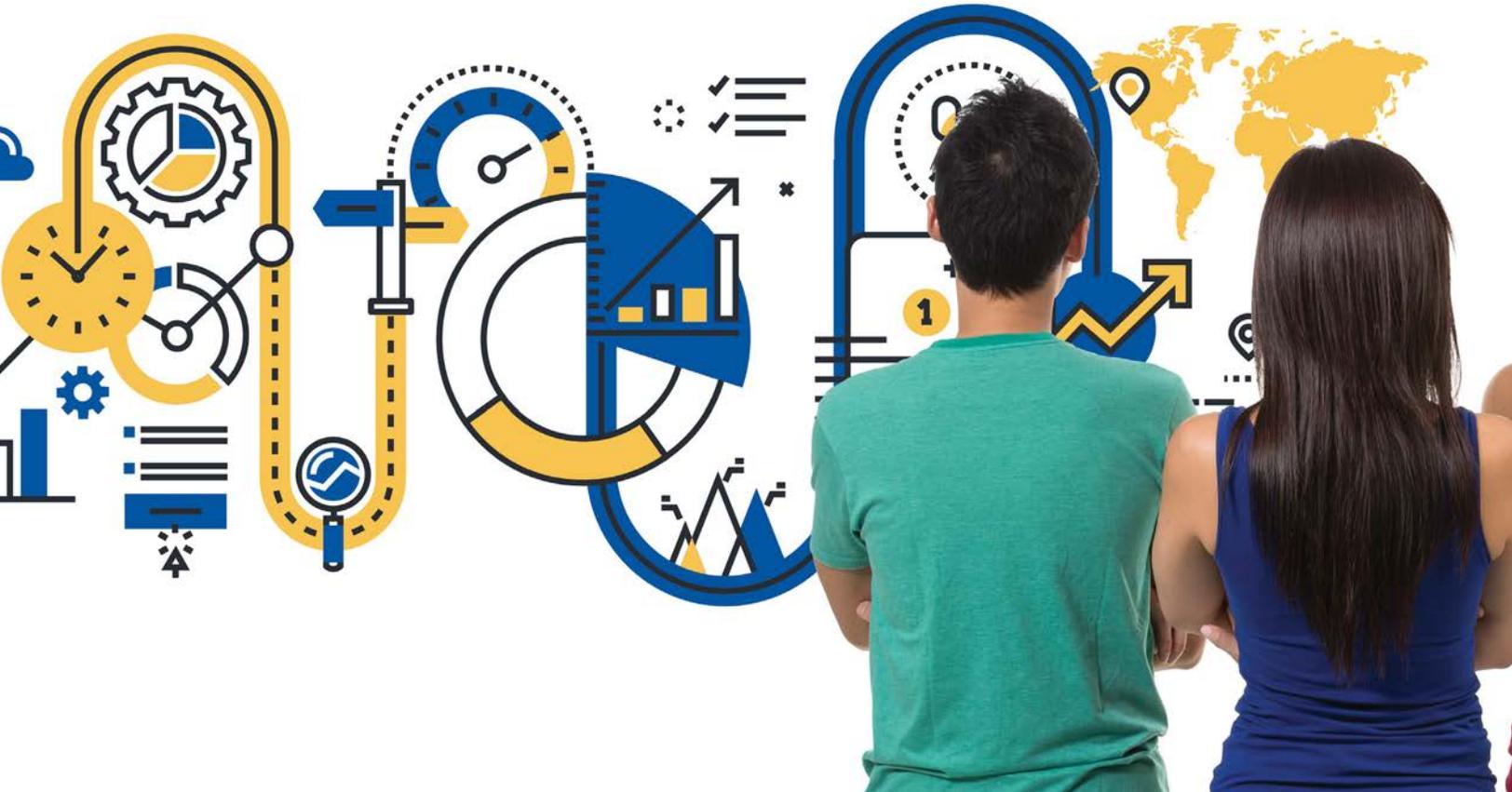
A recent showcase presented student and faculty research on small but critical details of the vast smart-city system. One project currently underway, “Creating a Community Infrastructure for Interoperable Emergency Connectivity,” will provide First Responders to disasters with a more complete picture of the community’s status in order to accurately assess conditions and organize available resources. One student project incrementally improved mass warning systems for highly probable disaster scenarios – in San José, that could be another Anderson dam failure, oil train derailment, earthquake, or biological hazard.

A second project, “Smart Illegal Dumping Monitoring Service and Infrastructure,” aims to provide the City of San José with an efficient way to monitor illegal

“The SJSU student and faculty teams show expertise and fresh ideas...”

waste dumping, detect abandoned or illegally parked vehicles, and support environmental data collection using smart cameras and sensors that communicate through low-bandwidth city network infrastructure.

City of San José employee, Anna Szabo, regularly attends showcases like this with her colleague, Environmental Services Program Manager, Shikha Gupta. “The city’s been tackling the illegal dumping issue – it’s really a difficult and complex one,” said Szabo. “The SJSU student and faculty teams show expertise and fresh ideas when it comes to detecting illegal dumping hazards.” 🌟



FACULTY ACCOMPLISHMENTS



Computer Engineering professor Young Hee Park and Department Chair Xiao Su

just won a grant to advance the knowledge of cybersecurity education by creating hands-on labs and curriculum on SDN/NFV. The course materials, along with nine hands-on labs, will aim to increase the educational resources for cybersecurity, particularly for security in new networking technologies.



A Major Research Instrumentation proposal by **Alessandro Bellofiore** (Biomedical, Chemical and Materials Engineering [BCME]), **Liat Rosenfeld** (BCME), **Kathryn Gosselin** (Mechanical Engineering), **John (Sang-Joon) Lee** (Mechanical Engineering), and **Anand Ramasubramanian** (BCME) was accepted for funding by the NSF. They proposed to acquire a High-Speed Particle Image Velocimetry instrument.



Hyeran Jeon (Computer Engineering) won a California Energy Commission Grant for her “Enabling Energy Efficient Data Centers in Smart Power Distribution Systems” project with UC Riverside.



Retiring **Aviation professor Glynn Falcon** won the Wright Brothers Master Pilot Award, the most prestigious award the FAA issues to pilots.



Winncy Du (Mechanical Engineering) won Best Presentation Award at the 2017 International Conference on Mental Health for her paper, “Brain Sound Features, Detection and Interpretation.” She also co-authored a paper that won Best Presentation at the 19th International Conference on Biomechanical Systems and Cardiovascular Biomechanics: “Stroke Rehabilitation via Electroencephalogram Sensors and an Articulated Robot.”



Amit Saha (BCME) co-authored an article in the *Biophysical Journal*, a leading topical journal in the field of biomechanics and biophysics. “Cholesterol Regulates Monocyte Rolling through CD44 Distribution,” includes contributions from Anand Ramasubramanian (BCME).



Ahmet Bindal (Computer Engineering) published two textbooks in 2017: *Electronics for Embedded Systems*, and *Fundamentals of Computer Architecture and Design*.



Over the summer, **Buff Furman** (Mechanical Engineering) worked with students on the Spartan Superway project, making half-scale and 1/12th scale models, the connecting mobile app, and structural, suspension, and solar design work for the upcoming full-scale test track, due to break ground in 2018. Students included graduates and undergraduates across the engineering disciplines, two high school students, and four ME undergraduates from Pusan National University in South Korea.

NEW FACULTY



FABRIZIO VERGINE

Assistant Professor,
Aerospace Engineering, Ph.D.,
University of Texas at Arlington



TYLER SPENCE

Assistant Professor,
Aviation and Technology, Ph.D.,
Purdue University



MATT LEINEWEBER

Assistant Professor,
Biomedical Engineering, Ph.D.,
Cornell University



MELINDA SIMON

Assistant Professor,
Biomedical Engineering, Ph.D.,
UC Irvine



LUKAS GERBER

Assistant Professor,
Chemical Engineering, Ph.D.,
ETH Zurich



RIBAL ATALLAH

Assistant Professor,
Computer Engineering, Ph.D.,
Concordia University, Montreal, Canada



GHEORGI GUZUN

Assistant Professor,
Computer Engineering, Ph.D.,
University of Iowa



SANKET TAVARAGERI

Assistant Professor,
Computer Engineering, Ph.D.,
Ohio State University



JONATHAN PONNIAH

Assistant Professor, Electrical
Engineering, Ph.D., University of Illinois
at Urbana-Champaign



JUZI ZHAO

Assistant Professor,
Electrical Engineering, Ph.D.,
George Washington University



HONGRUI LIU

Assistant Professor,
Industrial and Systems Engineering,
Ph.D., University of Washington



POUYA OSTOVARI

Assistant Professor,
Industrial Technology, Ph.D.,
Temple University



DAVID YAN

Assistant Professor,
Industrial Technology, Ph.D.,
Deakin University, Australia



DAHYUN OH

Assistant Professor,
Materials Engineering, Ph.D.,
MIT



CRYSTAL HAN

Assistant Professor,
Mechanical Engineering, Ph.D.,
Stanford University

STUDYING SATURN BY RADIO SIGNAL FROM CASSINI

Twenty-six years of work and a
spectacular Grand Finale

ESSAM MAROUF IS THE ASSOCIATE DEAN FOR RESEARCH

and an electrical engineering professor at the Davidson College of Engineering. He's also been part of the NASA/ESA International Cassini-Huygens Mission's radio science team since the start of the mission in the early 1990s. The Cassini unmanned spacecraft, a robot equipped with twelve major data-collecting instruments, was launched in 1997, arrived to Saturn in 2004, and was in orbit about Saturn until September 2017.

Cassini's main observation targets have been Saturn itself and its beautiful ring system, its environment, and many of its 62 satellites, including the enigmatic planet-size moon, Titan. Marouf's team conducts three types of experiments, all relying on measuring perturbations caused by the objects of study to radio signals transmitted from Cassini to Earth. It takes 80 minutes for a radio signal to reach Earth from Saturn.

By capturing the perturbations of radio signals, Marouf's team were able to map the fine structure of Saturn's rings and determine sizes of their composing particles. In addition, the measured signal perturbations due to the gravity of Saturn or Titan, yielded important information about their interior structure, including the possibility



Photos by James Tensuan.

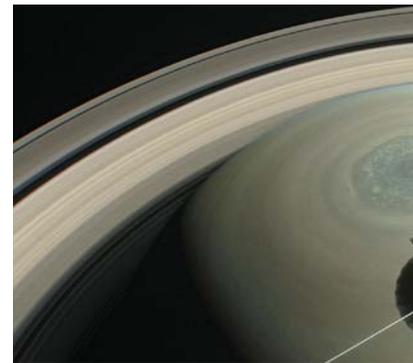
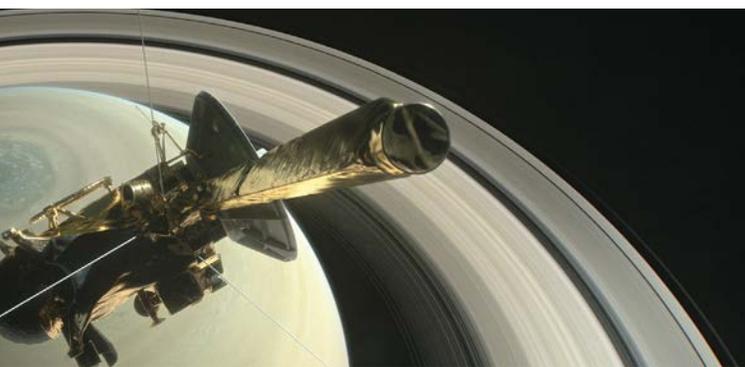


Photo courtesy of NASA.

of a liquid water ocean below Titan's surface. Also, by bouncing the radio signals off the surface of Titan, his team learned about the nature of the surface of this moon, especially over regions where Titan's thick nitrogen atmosphere rains liquid hydrocarbons on the surface, forming liquid methane lakes and seas.

The "life" of the Cassini spacecraft ended this September after 13 years of providing a treasure trove of scientific data about the Saturn system. "Cassini was about to run out of the fuel that controlled its orientation in space, and NASA didn't want Cassini to drift in space and possibly crash and pollute the surface of a moon of Saturn that potentially harbors primitive life," Marouf said. The mission designers planned its final 22 orbits to progressively draw closer to Saturn, diving through a gap between the rings and the top of Saturn's atmosphere.

On September 15, Cassini entered the upper atmosphere of Saturn and was pulverized; the percentage of plutonium pollution to Saturn's massive atmosphere was very, very small. The Cassini mission itself continues for another year so that Marouf and his colleagues can analyze the data, publish their findings, and bring an orderly closure to many years of work. ☺



AEROSPACE CHAIR ENCOURAGES SJSU CRITICAL THINKING, PROBLEM SOLVING IN OMAN

Addressing holistic student development in a number of ways

Nikos Mourtos, professor and Chair of the Aerospace Engineering department, delivered two workshops to faculty at Sultan Qaboos University in Muscat, Oman earlier this year. During the full-day workshops, faculty from all disciplines, department chairs, and associate deans, worked together in teams to re-design several of their courses in a way that ensures student development of critical thinking, problem-solving, design, communication, and lifelong learning, as well as team, change-management, and self-assessment skills.

"The traditional learning methods mostly involve pumping a lot of content to the minds of the students through lecturing without paying attention to developing real-life skills among the students," said Mourtos. "I attempted to sensitize the faculty members at SQU on developing skills in learners in relation to the content they deliver at classrooms or labs or in field work."

The workshops were very well received, opening the possibility for follow up workshops in the future.

Sultan Qaboos University has grown from 500 students in 1986 to more than 7,000 students representing 38 countries and distributed over 63 majors in 9 colleges: agriculture, arts, commerce and economics, education, engineering, law, medicine, nursing, and science. ☺

Photos by Nikos Mourtos



ROBOT EXPLORERS

Alumnus Eric Stackpole
Braves the Depths

BY MELISSA FRATERRIGO

AS THE UNDERWATER REMOTE-CONTROLLED

robot descends from the water's surface it zooms forward on a thin tether, its headlights the only things illuminating the marine world. Since 2013, the robots have been used for everything from exploring a shipwreck to conducting scientific fieldwork. Invented by Eric Stackpole, '09 Mechanical Engineering, co-founder of OpenROV, the robot gives off a futuristic vibe, but it's the way OpenROV generates community that is really ahead of its time.

Robot kits sell for \$899, or a pre-built model is available for \$1,450. On Openexplorer.com explorers share how they are using their rovers, and visitors can then “follow” and even “contribute” to an adventure. Right now, a father of two is building a rover with his daughters in hopes that by spring they will be able to explore the ocean near their Maine home. On its website, OpenROV openly shares its design specs to expand the invention's possibilities. “We are trying to make the exploration of the unknown something that everyday people can do. It doesn't take a science grant to see something no one ever has before.”

At SJSU, Stackpole designed robots to attend classes in his place, built satellites with the CubeSat Team, and served as president of the Amateur Radio Club. “SJSU has a huge number of students. You find yourself in a mixing pot, a sort of sample of the whole world. When you have an idea, you are almost certain to find other people who believe in it.”

In 2010, he was working on his master's degree and designing robots in his free time when a friend told him about a treasure buried in the bottom of a California cave. He partnered with a friend and the two turned to Kickstarter to raise funds. They surpassed their campaign goal of \$20,000 in about two hours. By month's end they had raised \$100,000 and OpenROV took off.



As owners of the vast network of 3,000 rovers share everything from hardware tips to videos on OpenROV.com, the company offers much more than a means to explore the underwater world. “You can have some amount of success with a business by selling a product, but really the way to find complete success is by creating a movement—in our case it is the democratization of exploration.” Stackpole has been fine-tuning these beliefs since he was a student—inventing robots through equal parts curiosity and community. 🍷



Photos Courtesy of OpenROV

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ALUMNI NOTES

SACHIN SHUKLA

MS Electrical Engineering 2016

I work in the domain of Cyber Security as a Software Engineer in a company where I started as an Intern. I am a believer of caring for society by sharing knowledge.

AFSHAN REHMAN

BS Industrial Systems Engineering 2015

I came here from Pakistan with no money. Coming to the US was a dream come true. Got a college scholarship, and getting a degree in Industrial and Systems Engineering led to a job at Kaiser Permanente as a Project Manager. I couldn't have done it with the help of all my professors from SJSU. Thank you so much.

ARDESHIR ESMAEILI

BS Electrical Engineering 2014

Joined Lunera, an LED Lighting startup, and successfully patented 2 LED products that sold more than \$60M in 36 months. Now Senior Technical Marketing Engineer at Hamamatsu Corporation.

SARA KNUTSON (FORMERLY BALRAM)

BS Aeronautical Engineering 2010

Currently the Science Operations Lead Engineer on the NASA New Frontiers mission: OSIRIS-Rex, which sent a spacecraft to explore and sample an asteroid. They launched in September 2016 and use a suite of onboard cameras for potential Earth Trojan Asteroids.

BILL RIPPLE

BS Civil and Environmental Engineering 2009

Recently nominated for the Marianas Young Professionals Spotlight Award. Last year, Ripple started his own engineering firm, Marianas Geotech Services, LLC, to provide specialized services in geotechnical engineering and construction materials testing to the Commonwealth of the Northern Mariana Islands.

MARILYN LACROIX

BS General Engineering 1987

Seeking a job in Quality Assurance on Treasure Coast Florida, Cape Kennedy to West Palm Beach.

COLLEEN FERGUSON

BS, MS Civil and Environmental Engineering 1985

Recently named the City of Sonoma's public works director.

LARRY HOLEMAN

BS Electrical Engineering 1991

Recently appointed as first Redmond Internship Coordinator for Economic Development for Central Oregon.

JOHN PRESLEIGH

MS Civil and Environmental Engineering 1997

County of Santa Cruz Public Works Director, Presleigh was named president of the County Engineers Association of California.

IN MEMORIAM

STEVE SAUER

September 24, 1955 - June 27, 2017. After graduating from San José State University with a degree in Aeronautical Engineering, he became a pilot and sold Cessna airplanes. He opened Signature Health Insurance Company in Grass Valley and enjoyed living in Grass Valley with Kay, his wife of 36 years.

UPCOMING EVENTS



Silicon Valley Leaders
SYMPOSIUM
Charles W. Davidson College of Engineering

SJSU | CHARLES W. DAVIDSON
COLLEGE OF ENGINEERING

SILICON VALLEY LEADERS SYMPOSIUM
15
years

FALL SERIES
2017
Thursdays, noon to 1 pm
Engineering building auditorium 189
<http://engineering.sjsu.edu>

Silicon Valley Leaders Symposium

Thursdays at noon | ENG 189

It's not just for students. Learn something new; meet a key player in your field. Show up a few minutes before noon for better seating.

Fall Preview Day

Saturday, October 21 | Engineering College | 9am-1pm

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.

TechDay ALUMNI Tailgate and Football Game

Saturday, November 4 | CEFCU Stadium | 10:30am-4pm

Fall Graduation Ceremony

Thursday, December 21 | Event Center | 1pm - 3pm

2018 Engineering Awards Banquet

Wednesday, May 3, 2018

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: _____	_____

SYNOPSYS LAB TURNS TEN, REFLECTS GROWING COLLABORATIVE RELATIONSHIP

Support empowers students and researchers to meet evolving challenges

FOR TEN YEARS, STUDENTS ACROSS THE

Davidson College of Engineering have enjoyed working in a state-of-the-art lab that supports electronic engineering and computer engineering courses, senior design projects, and MS circuit-design projects and theses.

Synopsys is a Silicon Valley company that makes advanced tools for silicon chip design, verification, IP integration, and application security testing. It opened the doors of SJSU Integrated Circuit Design lab during the same year iTunes downloaded its billionth song, and 22-year old Mark Zuckerberg turned down a deal with Yahoo.

Through a Charles Babbage grant (named after an English inventor and mechanical engineer who originated the concept of a digital programmable computer), Synopsys gave the Davidson College 32 workstations loaded with Electronic Design Automation (EDA) software. Synopsys President and co-CEO, Dr. Chi-Foon Chan, was present at the ribbon-cutting ceremony.

The lab has since enabled engineering students to do full custom analog and digital Integrated Circuit design, using industrial tools for ASIC synthesis, circuit simulations, nanometer device modeling, and fabrication process modeling in both academics and research. Electrical Engineering professor Dr. David Parent and director Morris Jones have been supervising the lab. “The effect of this gift has been profound for our college,” said Parent. “It has given us the foundation for industry-standard design flow, helping us to produce skilled, confident, work-ready students.”

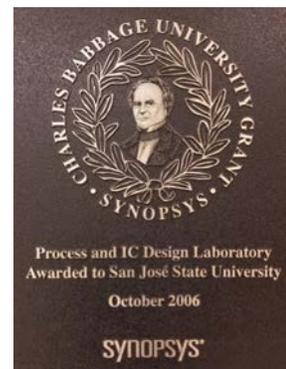
Synopsys and the Davidson College of Engineering have continued to partner on a variety of technical



presentations and projects, such as an ongoing and expanding internship program from which 27 SJSU engineering students were hired for the summer this year. Synopsys also generously sponsored SJSU's 2017 Women In Engineering Conference, a day in which leaders from scores of companies joined academics on the SJSU campus to empower engineering students.

“We appreciate the generous support provided by Synopsys over the years that allows us to provide relevant, state-of-the-art training and education facilities for our students,” said Sheryl Ehrman, Dean of the College of Engineering. “Collaborative relationships such as this one strengthen our university, our students, and the entire Silicon Valley community. I look forward to strengthening the SJSU-Synopsys relationship.”

“Synopsys is proud to partner with San José State University to provide students with the tools and training they need to be the next generation of innovators,” said Dr. Chan, adding that more than 160 SJSU graduates are now “a part of our company.” ☺



SPOTLIGHT ON A SCHOLAR

Engineering and nursing, and always building or fixing

Jordan Helledy, a Biomedical Engineering student who interns with Dr. Claire Komives in Materials Engineering, got her start by “always doing hands-on things with my dad, always building or fixing something.”

Born near Seattle, Helledy moved to California in the second grade. Her father is an engineer who works on aircrafts and satellites with Boeing. That engineering legacy, combined with her desire to go into some form of nursing in order to help people, landed her in the biomedical engineering field. She’s passionate about Materials Engineering: “It’s very important to think about which materials we use in and around the human body,” said Helledy. “It fits in

“It’s very important to think about which materials we use in and around the human body,”

with my love of biology.” She also feels comfortable in the biomedical cohort, which is 50% female. In it, she finds more collaboration than competition: “We study together, and we solve problems together.”

Helledy credits the SJSU chapter of the Biomedical Engineering Society (BMES) with fostering her own



professional growth. The SJSU BMES, a 60-person team runs an annual Bay Area Biomedical Device Conference on campus. Industry experts attend, and the students do everything from marketing to facilitation, providing great learning and networking opportunities. “I had to go to lots of different events,” said Helledy, who has been active in BMES since her freshman year. “The activities pushed me into industry and I found I was able to talk to people I didn’t know, and put myself out there.”

A scholarship solidified her decision to come to SJSU, where she enjoys the campus and the downtown area. When she can, Helledy makes the occasional escape to the redwoods at Henry Cowell State Park, or Santa Cruz. 🌲