Hands-on with the MPFL

Welcome to the College's Collaborative "Room of Requirement"

First-Generation Graduate
Defying the Impossible

Hiu-Yung Wong
Non-Traditional Path to Professorship

Iyer's AI
Can color preference predict your job match?
DEAN’S MESSAGE

THE COLLEGE OF ENGINEERING IS PROUD to celebrate some of the accomplishments of our alumni and professors in this issue. On our historically acclaimed San José State campus, we cultivate innovative students who enhance and propel our Silicon Valley economy with their bright ideas and concrete contributions. We are a multicultural, multifaceted community identified by our resourcefulness and grit. Within these pages of our spread, you will learn the stories behind some of our alumni leaders and professors.

Stories from alumni like Ganesh Iyer ’11, a Biomedical Engineer who moved from India to the United States and built his own AI company from the ground up, and Huy Tran, a Mechanical Engineer and Vietnamese immigrant representing SJSU at NASA Ames, invite a sense of hope and possibility to our campus.

We hope to inspire you as much as our engineering students inspire us every day. Storytelling builds bridges. It’s always empowering to find out that someone else shared the same ideals and struggles, and that we are not alone.

I’d also like to share that once again, the Charles W. Davidson College of Engineering held fast at #3 among best public engineering program for universities offering master’s and bachelor’s degrees. The college ranked #17 in the nation among all private, public and service academies offering master’s and bachelor’s degrees.

Success doesn’t have a particular formula, but the foundation to pursue it takes passion, determination, and focus. We commend current students and alumni for all of their accomplishments and we continue to welcome the next generations of leaders to come.

Go Spartans!

Dean Sheryl Ehrman
Don Boell Dean of Engineering, Charles W. Davidson College of Engineering at San José State University

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The College of Engineering was recently awarded a grant to acquire a metal additive manufacturing (AM) system for research and education. The system is a significant addition to the research supporting infrastructure of the CoE.

The instrumentation will enable researchers to develop new knowledge on the production of metals with high fracture and fatigue resistance, which are needed for the biomedical, defense, aerospace, and automotive industries. The instrumentation will also catalyze research advances in novel on-demand design of metamaterials for acoustic cloaking, biomedical imaging, and health monitoring.

In addition, the metal AM system will enrich graduate and undergraduate education, support outreach activities at K-12 schools, and aid teacher workshops. A new virtual reality metal AM teaching module will be developed and made available for engineering students, high-school students, and the public. Research findings will also provide the basis for a new machine learning and computational mechanics class.

The cross-department grant-writing faculty team, led by Assistant Professor Ozgur Keles (Chemical & Materials Engineering), included Professors Feruza Amirkulova (Mechanical Engineering), Birsen Sirkeci (Electrical Engineering), Raymond Yee (Mechanical Engineering), and David Van (Aviation & Technology).

Andrea Coto was recently accepted into the Sustainable Design and Construction Masters program for Civil Engineering at Stanford. She has been the recipient of many awards, such as the 2018 Hispanic Engineering Achievement Awards Corporation’s Outstanding Undergraduate Student Leadership Award and the National Science Foundation Graduate Research Fellowship. Coto graduated with a BS in Civil Engineering in 2019, and was highly involved in engineering clubs and societies. Her research projects include experiments in cross-flow ventilation to help understand wind turbulence as well as research with the NASA Ames Research Center.

Sara Ortega recently won first place at the CSU Student Research Competition with her project “Exploring a Hybrid Design for a Short to Medium Range Transport Aircraft.” Her mentor was Nikos Mourtos. Ortega graduated from SJSU with a Masters in Aerospace Engineering in 2018, after completing a mathematics degree and teaching credential. Her project won first place over all 23 other CSU engineering colleges. She works simultaneously as a math teacher and as a STEM Teacher and Researcher at the SETI Institute and the NASA Ames Research Center. She has contributed to projects such as the Stratospheric Observatory for Infrared Astronomy with the Ames Research Center.

Hiu-Yung Wong’s Non-Traditional Path to Professorship

When he came across the open teaching position at San José State, Wong was very excited. “I heard that SJSU students work very hard, that many come from under-represented minority backgrounds, and they often have to work while getting their education. This attitude of the students was very important to me,” said Wong. His decision to work at the Davidson College of Engineering was further helped by not having to relocate, and by already having so many good connections in Silicon Valley.

“I heard that SJSU students work very hard, that many come from under-represented minority backgrounds...”

Since he joined the Electrical Engineering department, chaired by Thuy Le, Wong has felt encouraged by his department and the dean, Sheryl Ehrman. “The balance of research and teaching has been well balanced for me,” he said. “I have more freedom to explore what I continued on page 7
A First-Generation Graduate,
Defying the Impossible

IN CA MAU, A SMALL VILLAGE IN VIETNAM, she peeked through a hole in a roof while dangling from a mango tree 3 or 4 meters above the ground just to watch the televised moon landing. This moment was the key to a later invention of a new ablative heat shield material currently used at NASA.

The girl who observed the moon landing that night, Huy Tran, is now the Director of Aeronautics at NASA Ames Research Center and an SJSU alumna. She recently spoke at SJSU’s College of Engineering Spring 2019 Graduation ceremony and shared her inspiring story.

In 1980, the first-generation college graduate and Vietnamese immigrant moved to the United States with her family after being displaced from her home in Vietnam and spending one year in an Indonesian refugee camp.

Tran found her safe haven when she arrived in San Jose. “I came here to Silicon Valley without much English or money. This town welcomed us with open arms and offered me countless opportunities, one of which was the privilege to attend this great university—San Jose State,” Tran said.

A full-time student who also worked a part-time job, Tran first earned a bachelor’s degree in Materials Engineering, and then a master’s degree in Mechanical engineering. While earning her bachelor’s degree, she began her NASA career as an intern in 1982. She was a test engineer at the NASA Ames Arc Jet Complex, which simulates planetary entry heating conditions for spacecraft.

“You must love what you do and be passionate about your pursuits because passion helps us to think out of the box and be innovative.”

“An arc jet facility, in simple terms, is an arc heater that sparks a lightning bolt to heat a column of air to nearly the surface temperature of the sun and expand it through a convergence and divergence nozzle exit to generate the entry conditions for Earth or Mars entries,” Tran said.

In love with her job, Tran wanted to learn about everything arc jet: its arc heater, mechanical and electrical systems, the complex instrumentation and its steam engine that came from a World War II battleship.

She even listened to the hum of six massive pumps circulating the cooling water through thousands of copper pipes to keep this arc column of 10,000 degrees Fahrenheit airstream from melting. “I was so in tune with the facility that I could hear when these pumps were out of sync. This is what I mean about being passionate: be immersed and be in it!” Tran told the assembled graduating students.

“Now I’m working on device physics and neuromorphic computing,” he explained. Device physics is the study and development of components for processing information or for system control. An important focus is on miniaturization; reducing the size of individual components so that they can be integrated together in compact modules. Neuromorphic computing has been described on Intel’s web site as “concerned with emulating the neural structure and operation of the human brain, as well as probabilistic computing, which creates algorithmic approaches to dealing with the uncertainty, ambiguity, and contradiction in the natural world.”

His research interests include negative-bias temperature instability (NBTI), which is a key reliability issue in metal–oxide–semiconductor field-effect transistors. He is also interested in hot carrier degradation simulation in Fin Field Effect Transistors, nanowires, nanosheets, wide-band gap materials, device reliability and defect simulations, novel semiconductor device design and design technology co-optimization. Part of his work is reflected in 60 publications and patents. In his research, Wong continues to use TCAD (technology computer-aided design), which he described as “a lab in your laptop, from nano-wire through power electronics.”

Wong also holds a Master’s in Computer Science and Engineering and a Bachelor’s in Computer Engineering, both from the Chinese University of Hong Kong. He is a senior member of IEEE.
Tour Our Microscale Process Engineering Lab

ON THE THIRD FLOOR OF THE DAVIDSON COLLEGE OF
Engineering building, six rooms contain one of the most multidisciplinary labs on campus, where faculty, students and staff engage in research in micro and nano-scale fabrication. Microfabrication is a set of processes by which microelectronic devices are created, and these fabrication processes are also used in creating MEMS devices (micro electrical mechanical systems); bio-MEMS sensors and fluidic delivery systems; solar cells and other alternative energy devices; and fabrication of nanostructures for an array of emerging applications.

Most people who know the Harry Potter series of books and movies will remember the mysterious “Room of Requirement,” which appears when it is needed and is filled with whatever people need. The magical room adroitly adjusts to nuances and conflicting needs as well. The Microscale Process Engineering Lab, or MPEL, feels much like that room.

History of Community Participation

The MPEL was designed into the “new” College of Engineering building three decades ago when the building plans were still code-named “Project 88.” Former dean Jay Pinson set aside the space to build a semiconductor prototyping “fab,” and thus created one of the largest labs in the building. At that time, engineering classes were seriously impacted, and the MPEL opened up room for more students to learn while maintaining the College's high academic and hands-on standards.

Intel Corporation and Applied Materials were the founding partners of the new lab. At first, the rooms contained vent hoods and beakers, but lacked wet sinks. Chemical and Materials Engineering professor Emily Allen became one of the first lab directors, and turned the space into a wet lab appropriate for semiconductor processing. The vent hoods were replaced with large pipes for clean, dry air, nitrogen, deionized water, and oxygen. She then started a class where students made semiconductor transistor devices.

Along with Allen, MPEL faculty and staff have included Chemical and Materials Engineering professors Greg Young and Stacy Gleixner, John Lee from Mechanical Engineering, Dave Parent from Electrical Engineering (who designs processes and curriculum), Neil Peters, the Microelectronics Process Lab engineer, and faculty members Liat Rosenfeld, Anand Ramasubramanian, Mindy Simon, Dahyoun Oh, and Crystal Han.

One of the most important contributors to student support is the family of Dr. Walter C. Benzing, pioneer in the field of semiconductors. Dr. Benzing held several U.S. patents, authored numerous technical papers on semiconductor processes, and was a leader in early technology collaboration with Japan and China. Competitive fellowships in his name have been awarded annually to promising students who work in the lab.

In 2003 the 3,500 square-foot lab underwent major renovation with financial contributions from several traditional microelectronics companies including Intel, Applied Materials, Cypress, AMD, and Novellus. The redesign created a more effective space for the combined missions of research and training, enhanced with facilities to design and fabricate electronic devices such as transistors and solarcells.

Extensive research is carried out in the MPEL by faculty and students in Biomedical, Chemical and Materials, Electrical, Mechanical, and General Engineering, and by researchers from the College of Science. The MPEL is also used for an astonishing range and variety of courses. Semester-long laboratory classes include Introduction to IC processing and Design, CMOS Design and Processing, MEMS Fabrication and Design, and Advanced Thin Films. These classes are open to all engineering students as electives, which helps to create a source of trained and interested B.S. and M.S. students for independent research.

Heavily Used for Teaching and Research

“Understanding how devices are manufactured is a hard thing for students to learn in a school,” remarked Parent. Currently, transistor, solar cell, MEMS and microfluidics processes are “being done in Taiwan fabs, but analog circuit designers need to know how CMOS circuits are fabricated. These engineers will have to communicate ‘semiconductor processing’ to others. While we have great simulators available, you only see variances and meaningful numbers in the actual manufacturing process.” That’s where the student success value of the MPEL comes in.

Students who are enrolled in Introduction to Materials, and Electronic, Optical, and Magnetic Properties of Solids, tour MPEL facilities and process their own souvenir wafer. Through these one-time activities, more than 400 SJSU students get hands-on exposure to microfabrication every semester. In addition, several of the equivalent courses at local community colleges come to SJSU to take microelectronics labs. High school and community college students tour the facilities during the spring and fall College of Engineering Open Houses. The college is also an active participant in High Tech LA, an outreach event coordinated by Semiconductor Equipment and Materials International (SEMI) to increase representation of underserved populations in engineering.

“We probably have the highest ROI of any lab,” said Parent. “What is unique is that we are very flexible and nimble about what we can do in this space. And we understand how to prevent contamination, so we can safely have multiple ongoing processes.”

Parent is looking forward to continuing to modernize processes for research in High-K dialectrics, enhanced microfluidics, enhanced MEMS, and organic transistors, as well as using machine learning and AI in the semiconductor process control.

The MPEL opened up room for more students to learn while maintaining the College’s hands-on and high academic standards.
Interview with Ganesh Iyer, CEO and Founder of Dotin

Ganesh Iyer, Biomedical Engineer, MS ’11, is founder of Dotin.us, a company that uses Artificial Intelligence (AI) to understand human personality. “Dotin is a system that can identify your motivations of every talent, which aligns opportunities,” said Iyer. “The ‘Dot’ represents extracting and mapping business outcomes and “in” represents securing data.”

Submit ten of your favorite photos and Dotin can potentially determine your personality fit and an appropriate work environment. Based on the work of Shigenobu Kobayashi, Japan’s leading color psychologist, along with subsequent research linking color and personality, they use an algorithm to read only the colors of an image, disregarding any context such as facial expression, race or gender.

Color is the main determinant to this process, where color preference is linked to personality traits that can predict how well you’ll fit in with a company culture. As a result, learning and working styles can be identified so one can thrive in their suggested job match. Besides using color, the personality DNA company recently added more proprietary projects around understanding human motivations and personality. Through the choice of words and music that you listen to, Dotin is able to strategically profile those same outcomes as seen from images.

In a recent interview with Binghamton University, Iyer shared more thoughts about AI. “I think we are barely scratching the surface,” he said. “Humans are so complicated. If anyone tells us that AI is going to replace humans I would say it’s next to impossible unless we see every neuron being fired in the human brain and we understand when and why it is happening. When that happens, absolutely. There is not a single machine that can do that right now.”

Iyer also created an app called KonnectIn, a networking platform and resource for college students who can access staff and professors at the touch of their fingertips. It incorporates elements of Facebook, which helps users form study groups; and Indeed, the popular employment website that announces job opportunities. At San José State, the Biomedical Engineering Society piloted Konnectin for a year before the college adopted the app in 2017. Dotin is also being implemented by Intrideo, a candidate tracker in Canada, and by Price Waterhouse Cooper as it delivers government services in the United Kingdom.

In the life of the engineer turned entrepreneur, Iyer is never bored whether managing Dotin as CEO, unleashing his inner artist by doodling cartoons in his spare time or being a superdad to his young daughter.

The triple-threat SJSU alum has been cartooning for the past eight years and began when he was a kid in India. Iyer was inspired by an Indian cartoonist, RK Laxman, whose work was published in the Times of India. “The main reason I read newspapers was because of his cartoons,” said Iyer. “His cartoons communicated issues that were going on in India, but in a light-hearted way.”

This influenced Iyer to do the same, but for some more current issues in our generation such as technology and social media. He even created his own website in 2011 called TuukTuk to showcase his gallery of work.

Moving from Bombay to the United States was a hard-hitting transition for Iyer. “It was definitely a cultural shock,” Iyer said. While studying at Binghamton University to receive his master’s in 2002, Iyer experienced his first East Coast winter. “I had never seen snow in my life,” he said. Adjusting to the American dialect was also one of the challenges he faced while living in the Big Apple.

Now settled in San José and wearing a variety of hats, Iyer always wears his proud father cap around his five-year old, Aarya. He says that fatherhood is a constant learning experience and sometimes a humbling one. “I think being honest, unbiased and true to yourself is what I have learned,” Iyer said.

As far as providing words of wisdom to our future engineering leaders, Iyer advises to take advantage of any and every resource SJSU has to offer. “Work hard. Follow your passion and dreams. Your school gives you enough opportunities,” said Iyer.

Image Credit: Natsumetic Photography.
Alumni Notes

CHRISTINE ALLEN-BLANCHETT
Dual bachelor’s in Computer Eng and Mechanical Eng 2011
Notably named one of Princeton’s first Presidential Postdoctoral Research Fellows, Allen-Blanchett will be enhancing her recognized work in the field of “constraining models from machine learning to maintain compatibility with the underlying structure of variation in visual images.” She will be joining the scholars at Princeton after completing a PhD in computer and information science at the University of Pennsylvania.

BOB DEAN
BS Environmental and Structural Engineering 1989
An accomplished nature and wildlife photographer in retirement, Dean recently presented a talk on how best to photograph in zoos. He owns Views of Nature, a photography company, and has presented as a speaker and lecturer at numerous Colorado schools, such as the Rocky Mountain Conservatory. He has published 4 eBooks, including Depth of Field: A Photographer’s Guide to Understanding Focus. He is also President of the Colorado Urban Wildlife Photo Club and the Assistant Editor for the First Light monthly newsletter for nature photographers.

ANNETTE BIANCO
BS Aerospace Engineering, MS Engineering Management 1994
Bianco was a recent keynote speaker at an American Association of University Women lunch celebrating the achievements of the Tech Trek Science Camp scholars, a program that encourages female middle and high school students to pursue careers in STEM. Bianco has been a Former Chief Systems Engineer at Lockheed Martin and an International Space Station support contractor for NASA.

GREGG CUMMINGS
MS Environmental and Structural Engineering 1989
A Senior Associate and Senior Project Manager at Hazen and Sawyer, following more than 30 years of expertise in every step of water recycling and other programs, Cummings has been deeply involved in his field of study. Over the course of his career he has participated in a wide range of specialties, ranging from literature review, serving on committees, leading high school outreach efforts, and working directly with different agencies and companies.

SHANE GOLOBIC
BS Mechanical Engineering 2014
Shane Golobic, a Fremont, California native, is an accomplished winged/non-winged sprint car and midget racer. This year saw his first World of Outlaws win at Placerville Speedway and second career Series win overall.

JEFF MCNEIL
BS Chemical Engineering 1983
McNeil was recently appointed Vice President and Chief Operating Officer of Enphase Energy Inc, a company he has worked with in varied positions. Prior to this, he worked at Enersys Corporation as the Senior Vice President of Operations and Regulatory Compliance. He started at Cypress Semiconductor Corporation, advancing until he left the company as the Senior Vice President of Operations.

ROSA SUNG
BS Mechanical Engineering 2013
Sung has been employed at BART for over 5 years as a Vehicle Systems Engineer. She started there as an intern at BART’s Hayward stop, and was offered a position with the company after the internship ended. Sung’s work helps troubleshoot train issues that could be potentially very dangerous.

JIM MEYERS
Aeronautics Engineering
A major presenter at the International Energy Conservation Code update, Meyers is currently a senior associate and the Director of the Buildings Efficiency Program with the Southwest Energy Efficiency Project. He leads initiatives to input new energy codes, start new programs, and he is also a LEED Green Associate and Certified Green Professional. Meyers is part of the 2021 Board of the Energy Efficiency Business Coalition.

MANUEL PINEDA
Civil Engineering 1995
Pineda recently started a new position as Silicon Valley Power’s Chief Electric Utility Officer, adding to his existing work as an Assistant City Manager in Santa Clara. Pineda has over 22 years of experience in the public sector, including a position as San Jose’s Deputy Director in the Department of Transportation. Projects he has taken part in include the BART extension and the reconstruction of several freeway exchanges. He used to be the Director of Public Works in Sunnyvale, where he managed maintenance and operations.

CHARLES TUMBAGA
BS Electrical Engineering 2012
A keynote speaker at a recent Anritsu conference, Tumbaga explained "future proofing 5G and mm wave measurements with Anritsu components.” Tumbaga is currently a Product Marketing Engineer at Anritsu, where he oversees several production lines. Prior to his current position, he was the PME for another line of Anritsu products.

CRAIG SCHNEIDER
BS Mechanical Engineering 1993
Schneider is the new HNTB corporation’s Inland Empire group leader, where he will continue to grow the operations. Schneider has over 25 years of transportation engineering experience, specializing in Caltrans and public transportation projects. Notable projects he has worked on include: the I-15 express lanes design build program management for Riverside County, I-5 north managed lanes improvement project and I-10 and I-110 congestion pricing design, and traffic and roadway planning for proposed LAX transport facilities.
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 18 | Event Center**

**5th Annual Women in Engineering Conference**
**Saturday, March 14th, 2020 | Diaz Compean Student Union Ballroom**

**Engineering Awards Banquet**
**Thursday May 7th, 2020 | Diaz Compean Student Union Ballroom**

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**NOMINATE**
Who will you nominate? We are seeking nominations for an SJSU Engineering alumnus or alumna who has achieved superior professional accomplishments and/or has demonstrated outstanding citizenship through significant community or professional service. Applications will be reviewed by the Engineering Awards Banquet committee. The winner must be able to attend the banquet and make brief remarks on Thursday, May 7, 2020. Self-nominations are acceptable. Deadline to nominate an alumnus or alumna is Wednesday, April 1st, 2020. Go online to [http://bit.ly/DA2020](http://bit.ly/DA2020)

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**> We want to hear your news!**

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**In Memoriam**

**JOHN BUTHENUTH**
BS Civil Engineering 1978

Butenhuth studied Civil Engineering at SJSU between serving in the Navy in the South Pacific and serving in the Army in Germany. He went on to become a civil engineer with Caltrans. He was on the planning commission in Cupertino and served on the Santa Cruz Grand Jury. Butenhuth loved the outdoors and was an avid sports-player. He skied, gardened, traveled, and biked regularly.

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**TYLER ROSS CARLBERG**
BS Electrical and Electronics Engineering, 2017

Carlberg graduated from SJSU in 2017 with an Electrical and Electronics Engineering degree. He grew up in Modesto, and graduated high school in 2010. He started his career as a Hardware associate with Kali Care, and continued to advance. His most recent position was a Laboratory Engineer with UL, where he used his degree to work with a company that makes advances in science and technology.

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**WILLIAM MENTA**
MS Civil Engineering

Menta was a prominent figure in the field of civil engineering, particularly in the field of earthquake safety and building design. He earned a Masters Degree in Civil Engineering from SJSU and went on to make advances in post-tensioned concrete engineering with Western Concrete Structures, including making it safer to build in earthquake-unstable areas. In 1972 he started a design and general contracting business called ArcaBuild with a friend, which became a leading business in the Bay Area. They built the Monterey Plaza Hotel and many others. In addition to this, Menta was a well recognized specialist in earthquake safety for major commercial buildings both nationally and internationally. Menta was active and often traveled with his wife, visiting his relatives across America, as well as skiing, playing tennis, and helping local schools and charities.

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**NORMAN WOHLSCHELAER**
Civil Engineering

Wohlschlaeger graduated from SJSU with a Civil Engineering degree after serving in the US Army Corps of Engineers for two years, and making the decision to pursue a degree. After graduation, his first job was as a San Jose Municipal Engineer. He found a position he stayed with for over 25 years. Wohlschlaeger became the Chief of Sausalito’s public works department. He worked there until his retirement, overseeing major projects such as the construction of a new city hall and various other city projects.