ENGINEERING WITH
A MISSION

SCHOOL OF ENGINEERING
SANTA CLARA UNIVERSITY

CURIOSITY
ENGAGEMENT
COLLABORATION
INNOVATION
SCU.EDU/ENGINEERING

At Santa Clara University we are *Engineering with a Mission*, dedicated to excellence in engineering education, to student learning, and to providing impactful experiences in and out of the classroom. Our students are driven to use their knowledge and talents to improve lives, and we are dedicated to helping them succeed.

SCU's Jesuit tradition is about educating the whole person—mind, body, and soul—and preparing students to create a more just, humane, and sustainable world. Our undergraduate and graduate core curricula are designed to encourage students to think critically and act responsibly. Rigorous engineering courses help students achieve confidence in their technical expertise.

But Jesuit education isn't just about learning—it's about applying that knowledge by doing. Student clubs, co-curricular activities, contests, and innovation incubators allow students to flex their entrepreneurial muscles. Working alongside graduate students and Ph.D. candidates on a research team provides a window into how advancements are made in engineering. Interning at a Silicon Valley company shows how work gets done in industry. Working on an engineering project in a disadvantaged community illuminates the socio-economic and cultural influences that drive the best solutions.

This is Santa Clara Engineering. This is character-driven education. This is education that creates value—for the customer, for society, and for the engineer who finds a career of personal and financial satisfaction through meaningful work.

This is **Engineering with a Mission.**

LIVE

Learning to find ethical, sustainable, and compassionate solutions to the world's problems. That's what it means to get a Jesuit education in the heart of Silicon Valley. Santa Clara University strives to educate the whole person and to serve as a responsible model for the world.
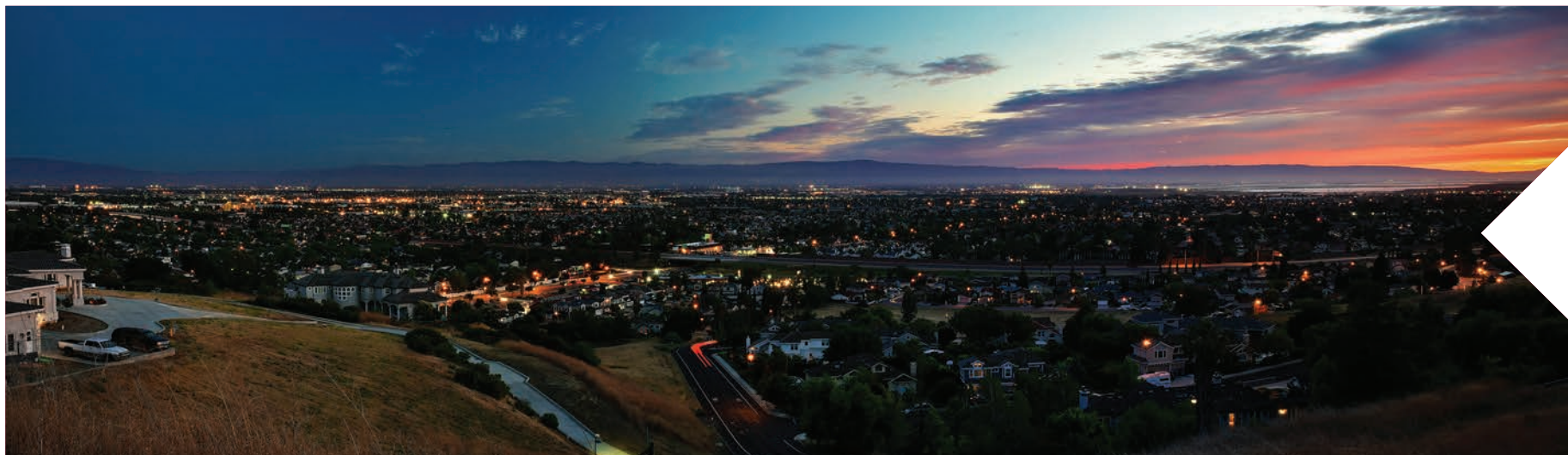
WORK

Silicon Valley is the world's hub for technology and innovation. Home to over 30 of the Fortune 1000 and thousands of tech companies, Silicon Valley is one of the global leaders in startup investments. Our engineering graduates go on to earn among the highest salaries (No. 8) in the country.*

PLAY

Swim. Hike. Play. Explore. The Bay Area is the perfect backdrop for Santa Clara University students to examine what they love and discover new passions, too. With San Jose and San Francisco short rides away, students are immersed in diverse environments and cultures.

According to 2022 PayScale College Salary Report

BE
CURIOUS

Learning doesn't start in a classroom but with a question. Engineering students at SCU learn how to challenge the world around them and look for ways to make it better.

Renee Niemi '86
Venture Partner, Mighty Capital; Board Director
Santa Clara University Distinguished Engineering Alumna

"The world isn't changing incrementally. We're at an inflection wave where we will experience a 10x change in the way we live our lives. We're on the cusp of a massive revolution, bigger than the Industrial Revolution at its time. Follow your curiosity, pick your areas of passion, and become part of this 10x future."

Student members of the American Institute of Aeronautics and Astronautics visit the NASA Ames Wind Tunnel.
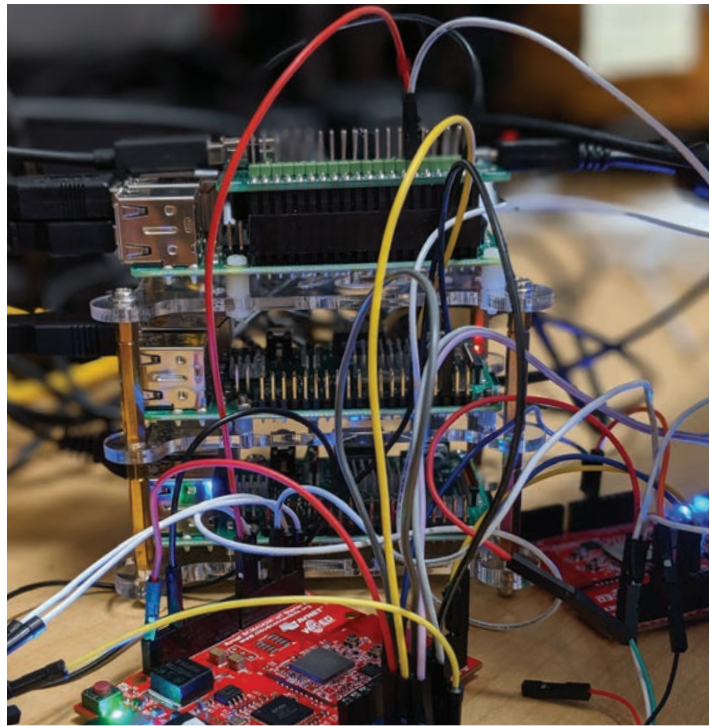
How do you get fresh food to low-income, inner-city communities? Even in Silicon Valley many people have difficulty accessing fresh, nutritious food. For their senior design project, electrical and mechanical engineering undergraduates designed a solar-powered, self-monitoring aquaponics growing system for a neighboring community. Now, fresh produce is regularly harvested from the system to supplement meals served by a local nonprofit.

What do you want to make today? With hand tools, power tools, 3D printers, laser cutters, circuit board fabricators, and more, students come to the Maker Lab to tinker just for fun, work on a class project, or prototype an invention of their own. Generous training schedules and open hours make it easy to get making fast.

20+
Engineering Student Clubs on Campus

BE
CURIOUS

A curious mind opens the doors to previously unimagined possibilities. Fuel your curiosity as you work on a project of your own in the Maker Lab, take on an internship at a local Silicon Valley tech giant, enter one of our innovation contests, tackle a humanitarian challenge through the Frugal Innovation Hub, or conduct cutting-edge research with a faculty mentor.

Try one, or do it all. This is the time to be curious about what drives you. This is the place to help you find your passion.
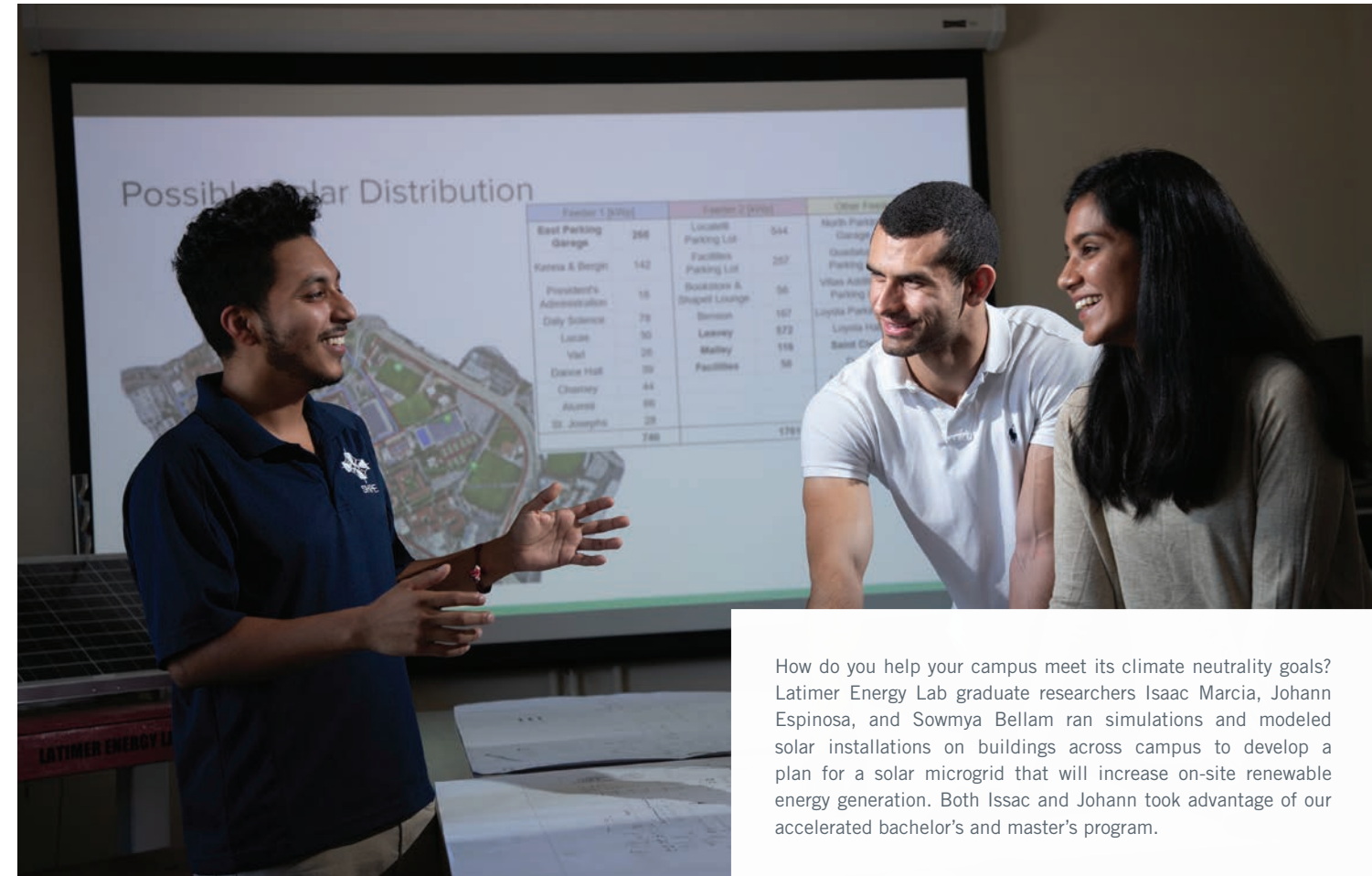
From remote health assessments to smart agriculture and smart cities, the Internet of Things will someday change the world in which we live and work. Students in SCU's Internet of Things Lab are helping that day come faster by creating a real-world evaluation test bed to replicate the behavior of networked devices; inspecting the impact of user activities on the reliability of communicating with IoT devices.

How do you help your campus meet its climate neutrality goals? Latimer Energy Lab graduate researchers Isaac Marcia, Johann Espinosa, and Sowmya Bellam ran simulations and modeled solar installations on buildings across campus to develop a plan for a solar microgrid that will increase on-site renewable energy generation. Both Isaac and Johann took advantage of our accelerated bachelor's and master's program.

BE ENGAGED

We're driven to build a more just, humane, and sustainable world. International research, immersion experiences, and community outreach projects foster real-world knowledge and help our students build empathy while advancing their technical skills and engineering acumen.

Gabriel Alcantar '08
Mott MacDonald, Senior Project Manager/Associate Advisory Board Member, Department of Civil, Environmental and Sustainable Engineering

"There is a special atmosphere about the engineering program and campus. From my freshman year when a Jesuit professor's guidance and compassion helped me make a pivotal career move to after graduation when the commitment of faculty to civil engineering inspired me to give back and volunteer, these experiences keep me coming back year after year to pay it forward."

Civil engineering seniors created a water catchment system for a school in Tanzania.

Working with clients around the world, students in the Frugal Innovation Hub advance humanitarian technologies as they take on a wide range of projects. Recently, students joined forces with Maya Pedal—a nonprofit in Guatemala helping those in need gain access to potable drinking water while promoting community involvement of women and children—to design, build, and implement a bicycle-powered water purification and transportation system.

Starting from a position of customer empathy, engineering seniors collaborate with teammates from SCU's public health science program to develop a low-cost, non-invasive detection system for cervical cancer for use by women in developing countries. The project carries on from year to year with new student teams.

250+

Humanitarian Projects Around The World Since 2011

SCU's Engineers Without Borders student chapter actively collaborates with a women's tile-making cooperative in Rwanda. But it's not all about the engineering. New teams traveling to Rwanda visit the Kigali Genocide Memorial and meet with local NGOs and government officials. Understanding the history, politics, and culture of the community is crucial—not only to the success of the project, but to the growth of our students.

BE
ENGAGED

Put your passion and your expertise into practice.
Expand your worldview by helping with an engineering project in a developing country, here at home, or through study abroad—yes, our program is structured to accommodate a quarter away while still allowing you to graduate in four years.

These high-impact educational experiences offer a broader view of the world inaccessible from a classroom. You'll gain first-hand experience of the community's problems and unique circumstances that will guide your decisions as you put engineering theory into practice. See the difference you can make as an engineer.

Call it Siri for the smartphoneless. Or an analog Alexa. Michael Neumann '03, M.S. '08, Ph.D. '17 developed a service for students in Tanzania to get "online" help for high school final examinations through SMS texts. Neumann first visited Tanzania as a Peace Corps volunteer and noticed many schools did not have enough teachers. Returning to the U.S. for graduate school, he continued his efforts abroad, co-founding and serving as executive director of the 501(c) nonprofit Tanzanian Empowerment Through Education Association, or TETEA, which in Swahili means "to speak out strongly for someone."

Featuring flexible labs, collaboration hubs, an Innovation Zone, and multidisciplinary project spaces, the Sobrato Campus for Discovery and Innovation is one of the largest STEM education facilities in the country.
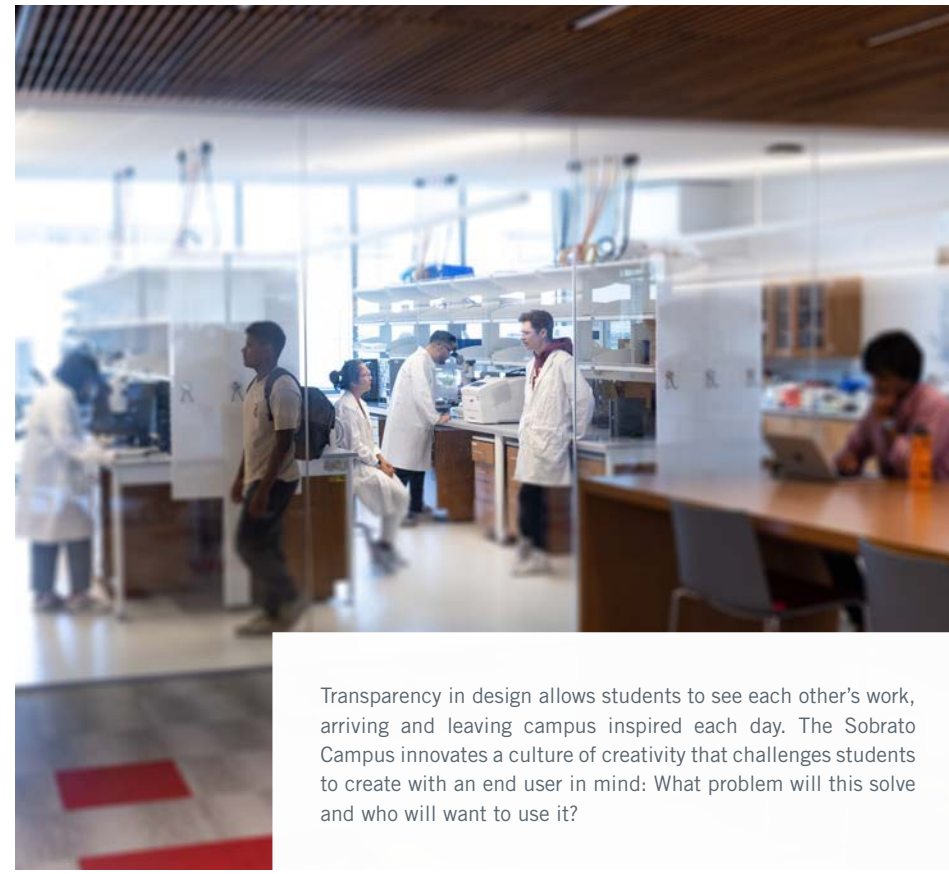
Transparency in design allows students to see each other's work, arriving and leaving campus inspired each day. The Sobrato Campus innovates a culture of creativity that challenges students to create with an end user in mind: What problem will this solve and who will want to use it?

19
Majors represented in SCDI bring different perspectives and new ideas

The Sobrato Campus for Discovery and Innovation is a meeting ground for Santa Clara University and Silicon Valley, with labs and workspaces supporting research projects, thought leadership, entrepreneurship, and global engagement. With on-site research projects led by tech and life science companies, internship opportunities, workshops, and visiting scholars, students start building contacts and gain professional experience as soon as they step foot on campus.

NEW
VISION
NEW
FACILITIES

The problems of the future are complex. Solutions require expertise across disciplines. The new Sobrato Campus for Discovery and Innovation is a 270,000-square-foot campus that changes the way students in STEM fields at Santa Clara University learn and innovate. A place where students, faculty, and industry come together to collaborate, connect, and create. SCDI Brings scientific discovery from the fringes and showcases it in the center of campus with the Innovation Zone, Robotic Systems Lab, Latimer Energy Lab, WAVE+Imaginarium mixed reality lab, and natural science labs for dedicated interdisciplinary education.
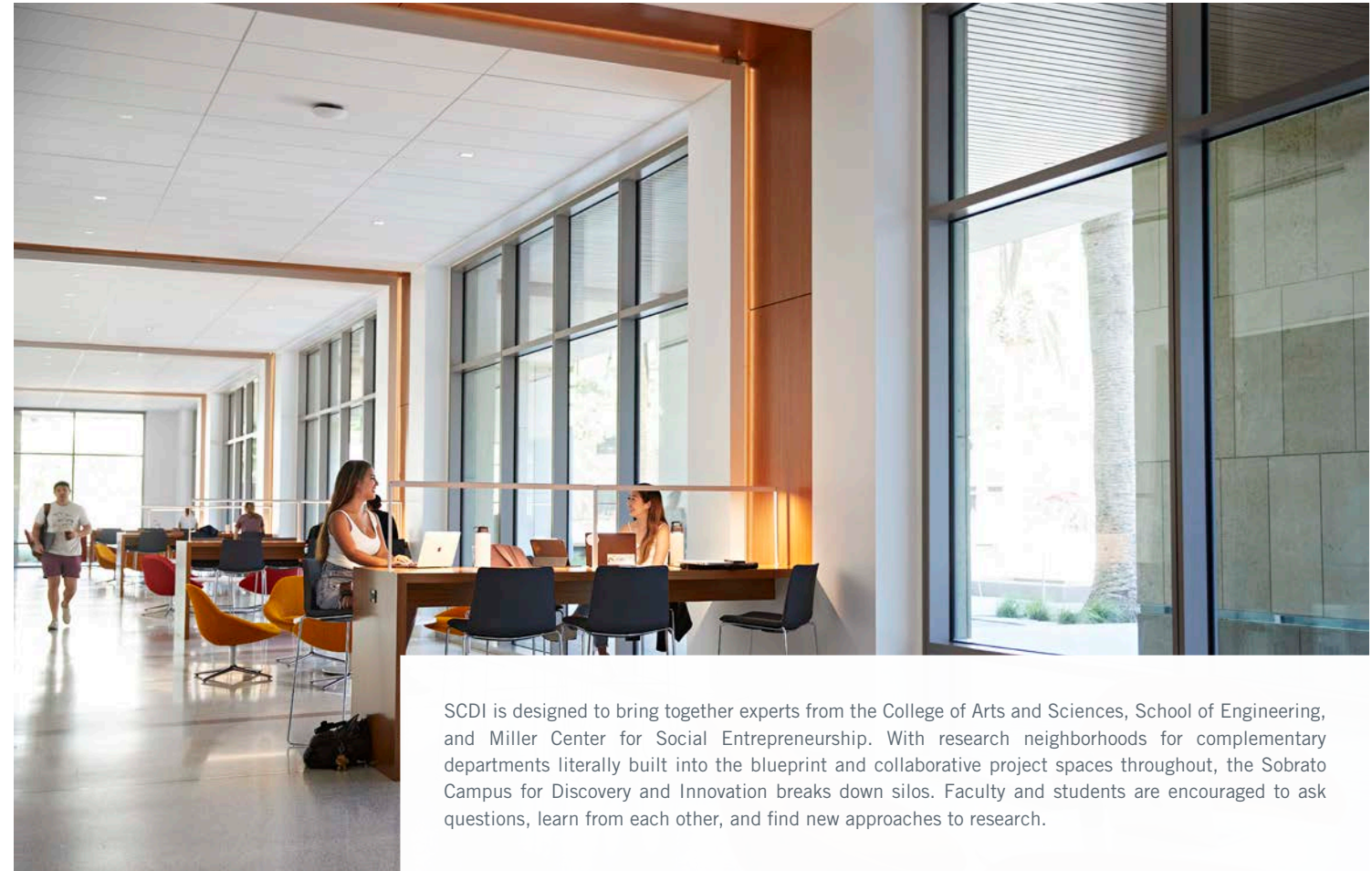

SCDI is designed to bring together experts from the College of Arts and Sciences, School of Engineering, and Miller Center for Social Entrepreneurship. With research neighborhoods for complementary departments literally built into the blueprint and collaborative project spaces throughout, the Sobrato Campus for Discovery and Innovation breaks down silos. Faculty and students are encouraged to ask questions, learn from each other, and find new approaches to research.

Engineering students collaborate on projects of all sizes, big and small.

BE
COLLABORATIVE

Together we can accomplish anything. Through faculty-led projects, hands-on labs, senior design capstones, and communal maker spaces, our students share expertise and work together to solve complex problems.
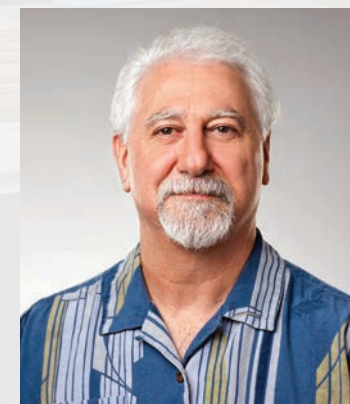
Chris Malachowsky M.S. '86
Co-founder, NVIDIA
Santa Clara University Distinguished Engineering Alumnus

Chris Malachowsky learned the value of teamwork as he was co-founding NVIDIA, a global leader in AI, supercomputing, and visual computing. "Who you surround yourself with matters," Chris says. "Look beyond the good times. How your colleagues respond when confronted by seemingly insurmountable problems or during a crisis could make the difference between success or failure."

Fulbright scholar James Wang puts the finishing touches on his team's entry in the Sacramento Municipal Utility District Solar Regatta. Contests like this are a big part of SCU engineering. Teammates from across disciplines work together to manage the project, research and purchase equipment, engineer systems, construct, test, iterate and reiterate right up through competition.

SCU is the only university authorized by NASA to run satellite operations. For the EcAMSat mission, SCU's interdisciplinary team of undergraduate and graduate students operated the satellite after launch, executed the primary science experiment, collected and decoded data, and maintained the health of the satellite over several months.

70+
Senior Design Team Projects Per Year

Children with asthma don't always receive the treatment they need because they feel stigmatized or don't want to sit still long enough to use a nebulizer, so a local pediatrician reached out to the Healthcare Innovation and Design Lab for help. Bioengineering students developed a nebulizer disguised as a water bottle, allowing portable and discreet treatment for patients of all ages.

BE
COLLABORATIVE

With interdisciplinary programs like Robotic Systems and Healthcare Innovation and Design, students at SCU gain expertise and confidence working with others in their own fields, across disciplines, and with industry professionals on authentic projects. Students join forces on projects in these programs and as members of faculty research teams. Real-world, collaborative problem-solving experiences facilitate critical thinking, spark creativity, and create the team players employers seek.

From their first year as undergraduates through their Ph.D. research, students are given hands-on group challenges to address, and as seniors, they team up for their year-long capstone work. After countless hours of collaborative work and many trials and errors, students get the stage to showcase their capstone projects to a panel of judges working in the industry at the annual Senior Design Conference.

The Robotic Systems Lab, recognized by the National Academy of Engineering as an exemplar program for real-world engineering, is ground zero for students and faculty from more than 10 departments to design and deploy advanced robotic systems and autonomous control technology missions on land and in air, sea, and space.

A Ph.D. alumnus' localization and mapping algorithm is put to the test in DARPA's Subterranean Challenge.

BE
INNOVATIVE

From an initial spark to design to startup, we don't just teach the basics. Our students are prepared to live and thrive in Silicon Valley or wherever their ideas take them. What's your big idea?

Sam Bertram '16, M.S. '18
CEO and Co-founder, OnePointOne

"I sought to do something impactful, unique, and worthwhile. SCU was everything I needed to get to the launchpad. If you have the desire to change a community, an industry, or the world, Santa Clara University is the institution to foster, incubate, and propel you toward your goals. Thanks to the professors, the students, and the engineering program, I have the tools I need to do something great."

Partnering with the India-based Jaipur Foot organization, mechanical engineering's Jamie Ferris and teammates developed a pulley tendon system for the HELP Hand—a Human-centered Electric Prosthetic—which they are designing to appear as lifelike as possible. "In India there is a strong stigma against the mechanical-looking prostheses that are most affordable; so much so that people would rather do without a device. Having a hand is very important for an individual's ability to thrive socially and economically, so it's our job to design a low-cost, realistic looking option," Ferris says. Though the teammates graduate, the work continues as the prototype is passed off to the next class of students to refine and one day bring to market.
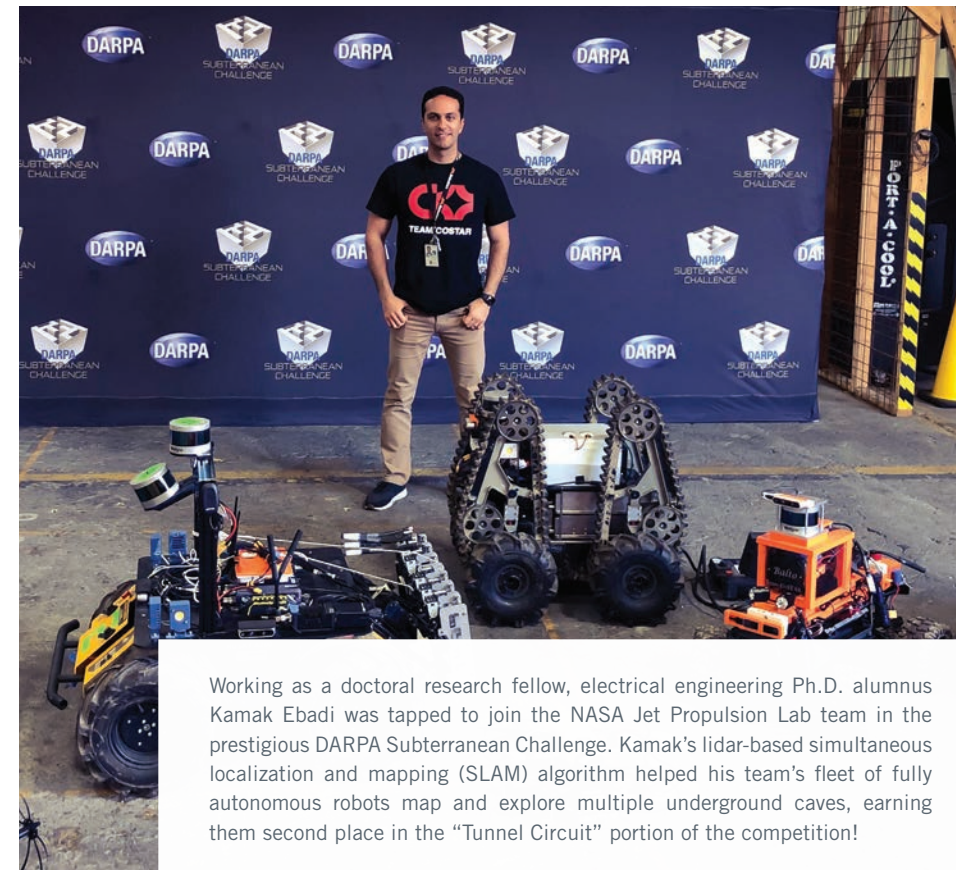
Working as a doctoral research fellow, electrical engineering Ph.D. alumnus Kamak Ebadi was tapped to join the NASA Jet Propulsion Lab team in the prestigious DARPA Subterranean Challenge. Kamak's lidar-based simultaneous localization and mapping (SLAM) algorithm helped his team's fleet of fully autonomous robots map and explore multiple underground caves, earning them second place in the "Tunnel Circuit" portion of the competition!

95%
Of Our Students Have A Paid Internship While At School

In the classroom, lab, and on field trips, our civil engineering students learn innovative ways to build and improve infrastructure—not just bridges and buildings, but water systems, transit networks and more.

BE
INNOVATIVE

Instilling an entrepreneurial mindset in our engineering students is a top priority at SCU. We teach students to seek out and define big issues, and develop solutions that create value for customers and society. Students are encouraged to think beyond the engineering to the ethical and social repercussions of their work. They're taught to be comfortable with ambiguity and how to try, fail, and try again. That's our mission.

Whether you want to launch the next big startup or be an agent of change as an intrapreneur within a corporate setting, entrepreneurial thinking will help you achieve your goals and our innovative teaching, learning experiences, labs, and faculty will help you get there.

Robot-assisted surgery makes difficult operations less invasive. At Intuitive Surgical in Sunnyvale—one of the top employers of Bronco engineers—student interns and alumni employees are making the procedures even safer. During his internship, Andrew Torrance '19 created a more efficient process for lubricating surgical staples for the Da Vinci Surgical System.

BE
YOU

Sure, engineering may be your calling, but there is so much more to you than that. Add a minor in Studio Art, sing, dance, or play an instrument, learn a new sport, become a paramedic. At SCU, we help you be YOU!

BE SUCCESSFUL
Degrees and Programs

Bachelor of Science Degrees

Bioengineering
Civil Engineering
Computer Science and Engineering
Electrical and Computer Engineering
Electrical Engineering
General Engineering
Mechanical Engineering
Web Design and Engineering

Minors

Aerospace Engineering
Bioengineering
Computer Science and Engineering
Construction Management
Electrical and Computer Engineering
Electrical Engineering
General Engineering
Healthcare Innovation and Design
Mechanical Engineering
Technical Innovation, Design Thinking,
and the Entrepreneurial Mindset

Bachelor of Science and Master of Science Accelerated B.S. /M.S. program

We offer an accelerated M.S. program to all
engineering B.S. majors and some majors in
the College of Arts and Sciences, through
which students may complete some units
toward the master's degree while still
enrolled as undergraduates.

Master of Science Degrees

Aerospace Engineering
Applied Mathematics
Bioengineering
Civil Engineering
Computer Science and Engineering
Electrical and Computer Engineering
Engineering Management and Leadership
Mechanical Engineering
Power Systems and Sustainable Energy
Robotics and Automation

Graduate Minor

Science, Technology, and Society

Engineer's Degrees

Computer Science and Engineering
Electrical and Computer Engineering
Mechanical Engineering

Doctor of Philosophy Degrees

Computer Science and Engineering
Electrical and Computer Engineering
Mechanical Engineering

Certificate Programs

Electrical and Computer Engineering
- Digital System Design
- Integrated Circuit Design
  and Technology
- Digital Signal Processing
  and Machine Learning
- Digital Signal Processing Theory
- Fundamentals of Electrical and
  Computer Engineering
- RF and Applied Electromagnetics
Frugal Innovation
Mechanical Engineering
- Design and Manufacturing
- Dynamics and Controls
- Mechanics and Materials
- Mechatronic Systems Engineering
- Thermofluids and Energy
Renewable Energy

FIND YOUR MISSION
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