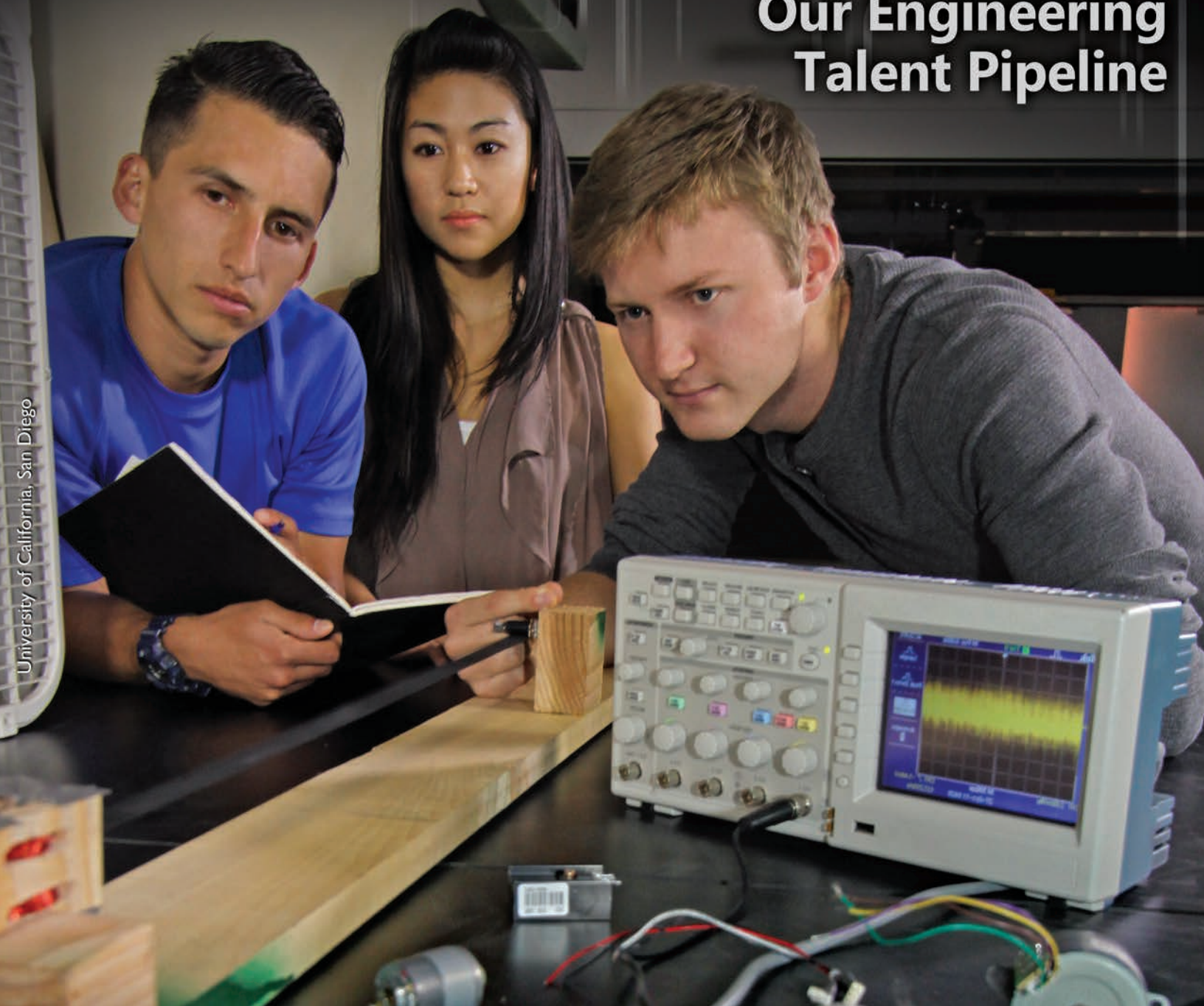


Jacobs School of Engineering News Winter 2011/2012

Pulse

Our Engineering Talent Pipeline



University of California, San Diego

Diversity in our Engineering Talent Pipeline

On October 14, 2011, we officially launched the IDEA Student Center at the Jacobs School of Engineering. The IDEA Student Center promotes Inclusion, Diversity, Excellence and Advancement among students, faculty and staff across the Jacobs School; and my hope is that the center will transform the culture and climate of the school.

Based on the most recent numbers available, only 57 percent of the students who begin their undergraduate studies at the Jacobs School earn a degree here. We are not unique, retention in engineering is a problem across the country.

Part of the new center's mission is to foster the development of diverse, innovative technology leaders. This involves reaching out to students from traditionally underrepresented groups in engineering — a population that includes first-generation college students, underrepresented minority students and women. The IDEA Student Center works to attract a diverse pool of students to the Jacobs School and then, crucially, strives to improve retention rates. Currently, students from traditionally underrepresented groups in engineering have significantly lower retention rates than other students at the Jacobs School.

Why do these students leave engineering majors in disproportionate numbers? Research shows that insufficient academic preparation, poor performance in introductory classes, feelings of isolation, and lack of mentoring lead to attrition.

The IDEA Student Center is responding with programs that offer academic preparation, mentoring, peer support and opportunities for community building. Our efforts invariably seek to get students fully involved in their engineering education. The most important retention tool that we have is student engagement.

Through the IDEA Student Center, we encourage students, from day one, to participate in student organizations here at the Jacobs School. The IDEA Student Center team also guides our students toward opportunities to work in multidisciplinary teams that produce deliverables for companies and nonprofits; to work in the research labs alongside our faculty and graduate students; to take our leadership courses, workshops and forums; and to practice entrepreneurship skills.

In this issue of *Pulse*, we introduce our IDEA Student Center and highlight some of the complementary programs that challenge and enrich the students in our engineering talent pipeline. I invite you, our alumni and friends, to engage with the IDEA Student Center — perhaps as a mentor or advisor to individual students or to a student organization. More information on connecting with Jacobs School students through the IDEA Student Center is on page 6 of this issue.



FRIEDER SEIBLE, DEAN



Jacobs School of Engineering

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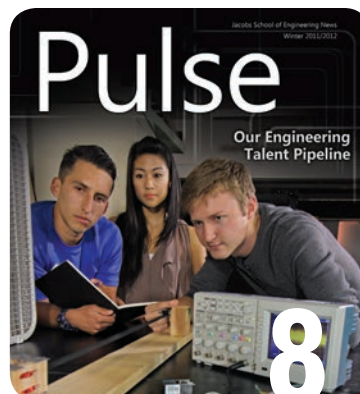
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Cover shot: Global TIES students are designing a "humdinger" — essentially a 1-meter long wind belt that draws energy from oscillations produced by a phenomenon known as aeroelastic flutter — to provide electricity for developing communities in Manila and other areas of the Philippines. The humdinger could produce enough energy in one month to charge a cell phone for a year. See story on Pg. 8

Shu Chien Wins National Medal of Science



Bioengineering professor Shu Chien received the National Medal of Science from President Barack Obama on Oct. 21 at a White House ceremony. Chien is an expert on how blood flow and pressure affect vessels, and his research has led to the development of better diagnostic tests and treatments for atherosclerosis. He is also collaborating on multiple projects in regenerative medicine to develop a process to identify the best environments in which to grow stem cells.

Pleased and humbled by the honor, Chien said the National Medal of Science is an important symbol of the nation's investment in scientific research and innovation.

Ask Chien about the current state of science and engineering education and U.S. investment in scientific research, and you'll get a thoughtful answer built from his years of experience as a teacher, researcher and learner.

Unfortunately, he fears that investment is

dwindling in ways that could cause long-term harm to the nation's economy and pre-eminence in science and engineering.

"What makes the economy strong? It's the scientific base," said Chien. "Beyond the symbol, we need to have more substantive support," he added. In addition to spurring the kind of innovation that creates new technologies, companies and jobs, investment in research also encourages young people to pursue science and engineering fields.

Chien left Columbia University to join the bioengineering program at UC San Diego in 1988.

The program had just six faculty members. Still, Chien saw what he could help build here; and the potential was too alluring to pass up. He led the effort to form the Department of Bioengineering in 1994. He currently serves as director of the UC San Diego Institute of Engineering in Medicine.

Now, the bioengineering department is a leader in systems biology, regenerative medicine and multi-scale bioengineering focused on understanding, diagnosis and treatment of human disease.

The department also ranks number one in the nation in bioengineering doctoral programs, according to the National Research Council. Chien said UC San Diego pioneered the multidisciplinary approach to solving big problems that all major academic institutions now want to emulate. "Every major medical school wants to link up with an engineering school," said Chien, who cited physical proximity; support from the deans of each of the relevant schools on campus; and exceptional faculty and students for UCSD's leadership in this area.

In honor of Professor Chien, a fundraising initiative is under way in the Department of Bioengineering. For information, contact Rodrick Echols at **(858) 822-4444** or rechols@ucsd.edu.

Fallen Star Lands on Jacobs Hall

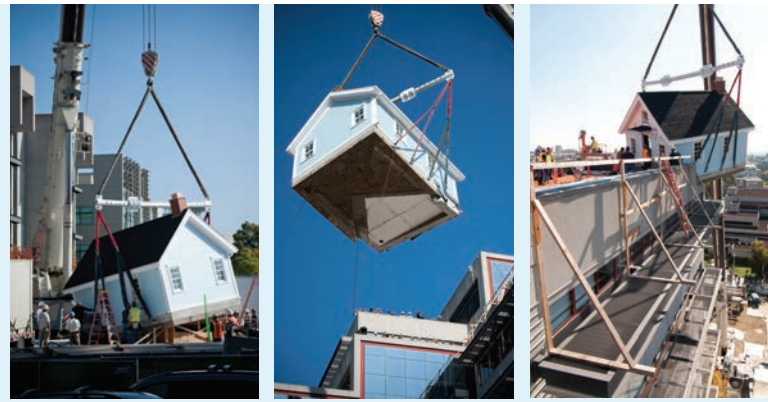
A scene right out of “The Wizard of Oz,” with a few modern twists, took place Nov. 15 at the Jacobs School of Engineering. A small house landed on top of Jacobs Hall (EBU1), hoisted by one of the largest cranes in the United States. It was all part of the installation of a new sculpture by artist Do Ho Suh for the Stuart Collection, which brings site-specific works of art to campus.

The work, titled *Fallen Star*, features a three-quarter-sized version of a house in Providence, R.I. The entire sculpture consists of the house, cantilevered at an angle from the corner of Jacobs Hall, surrounded by a roof garden.

Fallen Star was built to withstand winds of 100 mph and conforms to California earthquake building codes. The concrete foundation is 18 inches thick, compared to 4 inches on a regular house. The house weighs in at about 70,000 pounds.

The work is supported entirely by private donations to the Stuart Collection and a grant from the National Endowment for the Arts. The Jacobs School already is home to two other pieces in the collection: *Bear*, in the Engineering Courtyard, and *Vices and Virtues* at the Powell Structural Systems Laboratory.

Fallen Star should be completed in early 2012. Information on visiting the sculpture will be available from the Stuart Collection. <http://stuartcollection.ucsd.edu/>



Bioengineering Students Named 2012 Siebel Scholars

Five bioengineering Ph.D. students whose research is aimed at improving human health are among the 2012 recipients of the annual Siebel Scholars awards. Selected for their outstanding academic performance and leadership, each student receives a \$35,000 fellowship during the final year of their studies.

Jessica DeQuach works in Karen Christman’s Biomaterials and Regenerative Medicine lab. Her work includes tissue-specific matrices for

injectable tissue engineering scaffolds to treat ischemia in the brain.

Che-Ming Jack Hu develops nanotechnology platforms and anti-cancer nanomedicine with advisor Liangfang Zhang.

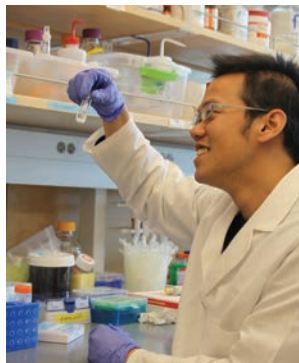
Dan Kagan from Joseph Wang’s Laboratory for Nanobioelectronics crafts nano-scale rockets that can detect cancer cells, isolate proteins and provide targeted drug delivery.

Lauren Hruby Jepson is working on building a better retinal prosthesis for the visually impaired. She works at the Salk Institute in the lab of neurobiology professor E.J. Chichilnisky as well as at the Retinal Engineering Center of Jacobs School professor Gabriel Silva.

Nathan Lewis is a member of the Systems Biology Research Group led by Professor Bernhard Palsson. His research involves the use of large models of metabolism to study prokaryotic biochemistry and evolution.



Jessica DeQuach



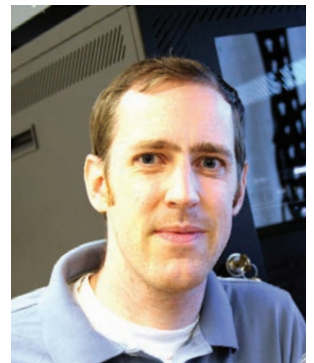
Che-Ming Jack Hu



Dan Kagan



Lauren Hruby Jepson



Nathan Lewis

IDEA Student Center

Inclusion, Diversity, Excellence and Advancement are goals of the new IDEA Student Center at the Jacobs School of Engineering, which opened this fall. The IDEA Student Center supports the academic, professional and personal development of all students at the Jacobs School of Engineering. The center aims to improve retention and graduation rates; attract more underrepresented students; encourage undergraduates to pursue research; and get students in elementary, middle and high school, as well as community college, excited about a career in engineering.



The creation of the IDEA Student center already has led to significant changes, said Jacobs School Dean Frieder Seible. Initiatives launched this year include a summer prep session for freshmen selected as IDEA Scholars, as well as a mentoring program that connects graduate and undergraduate students.

Dozens of students, faculty, staff, administrators and corporate partners celebrated the center's official dedication on Oct. 14. The audience heard from Stedman Graham (below),

a well-known businessman, educator and author, who sits on the Council of Advisors to the Dean of the Jacobs School.

“The dedication at Jacobs Hall, which brought together people from all over campus, is a recognition of our achievements. But we are not done,” Seible said. “We are just getting started. I want the IDEA Student Center to transform how we live together, how we work together and how we accomplish our mission here at the Jacobs School.”

The center's creation dates back to unrest on campus in 2010, after which Jacobs

School officials created a voluntary Diversity Advisory Council. Faculty, students, staff, alumni and industry advisers eagerly joined and gave generously of their time. The council recommended creation of the IDEA Student Center.

In addition to its outreach, retention and mentoring initiatives, the center supports all student organizations at the Jacobs School, including the Triton Engineering Student Council; the Jacobs Graduate Student Council; engineering diversity organizations; project, service and competition teams; professional student organizations; and honor societies.



Stedman Graham (left), a businessman, educator and author talks with biongineering professor Todd Coleman (right) at the IDEA Student Center dedication.

Get involved

- Work directly with student organizations or mentor individual students
- Provide advice on careers and professional development
- Sponsor a program or a scholarship

Alumni and the broader Jacobs School community are key to the center's success. “Alumni can give toward the mission of the center in many ways, including time, talent and treasure. We couldn't achieve our goals without community support,” said IDEA Student Center Director Terrance Mayes.

For more information, contact IDEA Student Center Director Terrance Mayes at idea@ucsd.edu or (858) 534-6105

JUMP: Pyramid Mentoring

The Jacobs Undergraduate Mentoring Program, or JUMP, is a new “pyramid” mentoring program at the Jacobs School. More seasoned students mentor newer students; and the Jacobs School community grows stronger.

Ten graduate students and 60 undergraduates make up the first human pyramid, which is divided into groups of seven: one graduate student, two seniors or juniors, and four freshmen or sophomores. The small groups are set to meet every other week while the entire group meets at least twice a quarter.

JUMP is a partnership between the IDEA Student Center and the Jacobs Graduate Student Council. The brain child of engineering graduate students Margie Mathewson and Laura Connelly, the program is supported by L3-Communications, which helped establish the JUMP structure. “We can see this program growing by leaps and bounds,” said Gennie Miranda, assistant director of the IDEA Student Center at the Jacobs School. “Right now, we are building a solid foundation.”



Summer PrEP: from High School to Engineering

As an engineering student, how do you maintain a 3.0 grade-point average while taking at least 12 units a quarter? What’s an elevator pitch? And where exactly is the trail down to the beach? These were some of the questions 22 incoming freshmen at the Jacobs School got answers to during the school’s first-ever residential Summer Pre-Engineering Program (PrEP), which prepares students for the transition from high school to engineering school. Alumnus John Slaughter, and his wife Ida, sponsored Summer PrEP 2011. During the four-day program, students met professors who discussed creativity in engineering and how engineering students learn. PrEP students also attended a reception with representatives from several prestigious companies; began building a network of friends; and explored La Jolla Shores and Balboa Park.

IDEA Scholars

The IDEA Scholars program is building a community of engineering scholars at the Jacobs School. The program offers support and achievement opportunities, and entering undergraduates are encouraged to apply. Students have quarterly meetings and participate in mentoring and tutoring. They experience Summer PrEP, take classes together, and will remain engaged through TIP, Global TIES, the Gordon Engineering Leadership Center and other programs. One goal is a 70 percent graduation rate. Kayse Sheppard and Antonio Gonzalez are among the first cohort of IDEA Scholars.



Kayse Sheppard

Kayse Sheppard dreams of designing rides for Disney amusement parks. But when she first enrolled at the Jacobs School of Engineering, she worried about handling the school’s rigorous curriculum and about making new friends. Her worries began to fade after she earned a spot as an IDEA Scholar and attended the Summer PrEP program, where she made friends and gained skills for thriving in a challenging engineering education environment. Kayse, a 17-year-old Native American and Hispanic student, also takes part in the JUMP mentoring program and has already begun giving back: she recently took part in an engineering outreach program at a local middle school.

Antonio “AJ” Gonzalez

Antonio “AJ” Gonzalez wants to come up with technology that uses renewable resources to power the world. He also is a midshipman in the U.S. Marine Corps Reserve and attends UC San Diego on a Naval ROTC scholarship. AJ, 19, is an IDEA Scholar. He chose UC San Diego for its top environmental engineering research and because of the city’s military bases. As the son of a single mother coming from a low-performing high school, he was worried about doing well in college. The PrEP program changed his mindset. He said he now knows he will succeed.



Global TIES

Early in 2012, a small village in the Philippines will be safer from typhoons, thanks to the work of students at the Jacobs School of Engineering — and to a simple device common in the United States. Thirty houses will be equipped with hurricane straps, which tie roof and walls together.

The students are part of Global TIES — Teams in Engineering Service — a program that connects undergraduates with nonprofit organizations needing help on a wide range of projects around the world. The team is working with Gawad Kalinga, an organization which aims to end poverty in the Philippines by 2024. Team members recommended installing the straps after researching U.S. building codes.

Global TIES believes in teaching students situational leadership, said Mandy Bratton, the program's director. "It's a little bit like a basketball team," she said. "Everyone is a leader when he or she has the ball." That approach has been successful in attracting underrepresented students, especially women, as well as students from other majors.

One of the program's goals is to teach students a different way of thinking. "We are trying to instill the humanitarian spirit," Bratton explained. Several team members said they indeed have a strong sense of mission. "It's not just an engineering program, it's a humanitarian program," said Kristine Carbullido, a sophomore who leads the Global TIES Philippines team.

The program welcomes alumni who would like to offer their time and expertise to guide students. Monetary donations and in-kind gifts, such as frequent flyer miles, are also welcome. The gifts would help send students to the countries where their projects take place. "We call it sneakers on the ground," Bratton said.

A Humdinger of a Cover Image



Victoria Fu, Crystal Agoncillo and Greg Hattermer work on the humdinger.

The cover image of this issue of *Pulse* illustrates a Global TIES project aimed at harnessing the power of the wind in order to provide electricity for developing communities in Manila and other areas of the Philippines.

These communities currently depend on the local grid, which is expensive and tends to be unreliable. To help save money and provide alternative sources of power, students are currently exploring two solutions. The first is the "humdinger," pictured on the cover and at left here. It's essentially a 1-meter long wind belt that draws energy from oscillations produced by a phenomenon known as aeroelastic flutter. (This phenomenon is similar to the vibrations that caused the Tacoma Narrows Bridge to collapse in 1940.)

But this time, the vibrations are harnessed to produce, not destroy. When the belt flutters in the wind, oscillations of the belt generate electricity by driving a system of magnets and a stator. The

humdinger could produce enough energy in one month to charge a cell phone for a year, said Crystal Agoncillo, an aerospace engineering major and the head of the wind power team for the Global TIES Philippines project. Humdingers can be built in array, much like solar panels. Students also are working on small windmills powered by motors salvaged from printers and other devices.

Agoncillo, whose mother is from the Philippines, visited the country last summer. Observing living conditions there had a huge impact on her, she said. It also made her work for Global TIES more meaningful.

"It's something to be proud of," she said. "And it's something that will improve people's lives." www.globalties.ucsd.edu

Team Internship Program

Do you need a team of top-notch interns to handle a project for your company over the summer? The Team Internship Program, or TIP, at the Jacobs School of Engineering can help.

Each summer, multidisciplinary teams of students tackle real engineering problems at companies throughout the nation and the world. Each team completes a significant project over the course of 10 weeks. Projects often result in patents or prototypes for the team's corporate partner. During summer 2011, 236 students worked for 36 companies on 76 on-site teams, including four international teams. TIP is run through the Corporate Affiliates Program at the Jacobs School.

Michael Hii, a fourth-year electrical engineering student, went to work for Qualcomm in Beijing as a summer 2011 TIP team member. He helped develop an augmented reality proof-of-concept app for Android phones. The experience encouraged Hii and his teammates to be independent, he said.

Exposure to a real work environment was a big perk for TIP participant Gregory Pinkel, who is earning a master's degree in electrical engineering at the Jacobs School. Pinkel worked on a flexible solar array TIP project at SAIC last summer with UC San Diego chemistry master's student Danny Chan. "I learned a lot of chemistry that would have been hard to learn otherwise, tips and tricks you can only get from people who are in the field," said Pinkel.

To inquire about hiring a TIP team next summer, visit: www.jacobsschool.ucsd.edu/TIP



"We wanted to share our adventure with everyone," said Dat Thanh Nguyen, a computer science major whose TIP team won the 2011 TIP photo contest for the (above) photo. Nguyen, Raymond Han and George Wu spent their summer in Liechtenstein designing a software app for Hilti, a global construction tool manufacturing company.

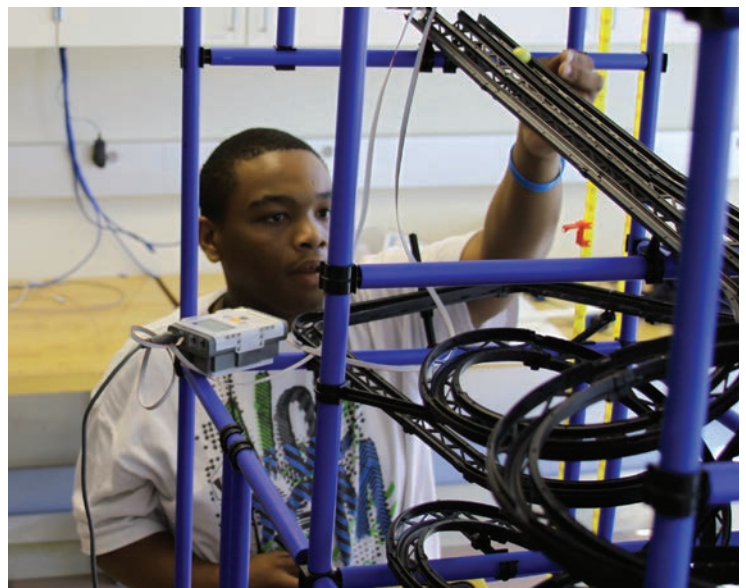
Outreach Programs and Student Organizations

Excite kids early. Inspire them to consider a career in engineering. These are two of the objectives behind Jacobs School outreach programs for middle and high school students. Many of the programs, including ENSPIRE, are run by students — and this provides a double benefit. The Jacobs School students doing the outreach are also enriched by the experience.

When Jacobs School students get involved in student organizations, whether it's through outreach projects, professional, diversity or other organizations, they have the opportunity to learn to plan, to communicate with others, to manage work flow and to coordinate complex events, said computer science undergraduate Justin Huang, president of the Triton Engineering Student Council, the umbrella organization for most student groups at the Jacobs School.

Getting involved in student organizations is also exciting. How else would you make motorcycles run on biodiesel, send balloons into the upper atmosphere, or build and race concrete canoes?

A list of student organizations is at: www.jacobsschool.ucsd.edu/student/student_org



COSMOS is a residential outreach program that introduces high school students to topics from biology to embedded programming and ultimately aims to get them motivated to major in a related discipline. The Jacobs School administers COSMOS at UC San Diego. Last summer, COSMOS students built programmable sculptures that move and interact (pictured), learned about climate change, earthquakes, red blood cells, and more.

von Liebig Entrepreneurism Center

Engineering students need an entrepreneurial mindset whether they plan to start companies or work in them. The Jacobs School's von Liebig Entrepreneurism Center supports the translation of university discoveries into viable products and services through pre-venture grants, entrepreneurial education, commercialization mentoring, and partnerships with industry, government, foundations and individuals.

“The role of proof-of-concept centers like ours is not to pick winners, it is to unplug the pipeline, seed as many projects as we can and give the faculty and students the resources they need to move forward,” said Rosibel Ochoa, executive director of the von Liebig Entrepreneurism Center.

Ochoa traveled to Washington, D.C., Oct. 18 and 19 to provide a briefing to Senate and House staffers on how the federal government can facilitate the transfer of university research into commercial products and companies. She presented alongside bioengineering professor Geert Schmid-Schoenbein and John Rodenrys, CEO of Inflammagen, a startup — catalyzed by

the von Liebig Center — that has licensed technology developed by Schmid-Schoenbein. The trip was arranged in coordination with CONNECT.

Their visit was timely as elected and other government officials wrestle with how best to invest in initiatives that have the potential to boost emerging industries and start fast-growing businesses that create jobs. Ochoa said a combination of federal, foundation and private company dollars channeled into proof-of-concept centers across the country, like von Liebig, is critical. There is an opportunity for Washington to support these programs in a substantial manner by reprogramming existing funding toward the proof-of-concept stage.

This translational phase of research is one of the most important in the evolution of a commercial product, but it is traditionally deemed as too risky and lengthy by private investors and entrepreneurs. They prefer to wait until the technologies have passed this phase before investing, leaving many technologies sitting in the lab and not going anywhere, explained Ochoa.

To attend von Liebig Center events and join in their 10 year anniversary visit: www.vonliebig.ucsd.edu



(L-R) Rosibel Ochoa, John Rodenrys, Geert Schmid-Schoenbein and John Watson

Master of Advanced Study: Professional Degrees for Engineers

Fall 2011: Embedded Systems and Medical Devices

A pair of master's degree programs for mid-career engineers — **Medical Device Engineering** and **Wireless Embedded Systems** — launched in Fall 2011 at the Jacobs School. The two graduate programs focus on emerging interdisciplinary fields and industry-specific application areas that are not available through traditional master's degree programs. The programs joined the successful **Architecture-Based Enterprise Systems Engineering (AESE)** program.

Rob Shanahan, from San Diego medical technologies company Cytori Therapeutics, is in the inaugural class of the Medical Device Engineering program. The coursework and interactions with top medical device innovators from UC San Diego have dovetailed with his job as director of product development, Shanahan said.



Gordon Engineering Leadership Center

The Gordon Engineering Leadership Center supports the development and training of engineering leaders through engineering leadership courses, the Gordon Forum lecture series, engineering leadership awards and scholarships.

The Center will host a semi-annual working group in February comprised of engineering leadership centers from top universities across North America. The meeting will focus on several big-picture issues in engineering education such as identifying the kind of training today's students need and the curriculum required to meet those needs. In the meantime, the Gordon Center is interested in hearing from Jacobs School alumni about what kinds of skills, training and leadership qualities they believe will be essential now and in the future.

Alumni are also invited to get involved in the center's work through mentorship of an individual student or group of students working on an engineering challenge project. There is also the opportunity to sponsor one of the center's events, in particular the annual Think Tank sessions, which bring together students, faculty, alumni and industry in a discussion about the future of a relevant and growing field. At the September Think Tank, participants focused on novel research and career opportunities in medical technology innovation.

www.jacobsschool.ucsd.edu/GordonCenter



At a recent medical technology innovation Think Tank hosted by the Gordon Center and the von Liebig Entrepreneurism Center, students, alumni and faculty discussed current research and industrial applications, and had a good time along the way.

Fall 2012: On Campus and Online

The Jacobs School plans to launch two new graduate degree programs for engineering professionals in Fall 2012 — Simulation-Based Engineering and Structural Health Monitoring. Courses for the two MAS programs are planned to be simultaneously delivered on campus and online.

- The **Structural Health Monitoring** program will provide working engineers with systems-level expertise in the field of designing and executing damage detection, monitoring and prediction strategies for structural systems.
- The **Simulation-Based Engineering** program will prepare graduates to solve multi-physics engineering problems using the techniques of modern computational analysis.

Learn More.

Contact Faye Kurpanek.
JacobsMAS@ucsd.edu
(858) 361-8160
<http://maseng.ucsd.edu>



Brain + Machine = ?

Research conducted by professor Todd Coleman, who joined the Department of Bioengineering in 2011, has demonstrated that a flexible, skin-like device, mounted with tiny electronic components, can acquire electrical signals from the brain and skeletal muscles and potentially transmit the information wirelessly to an external computer. The development, published Aug. 12 in the journal *Science*, means that patients struggling with reduced motor or brain function, or research subjects, could be monitored in their natural environment outside the lab. For example, a person who struggles with epilepsy could wear the device to monitor for signs of oncoming seizures.

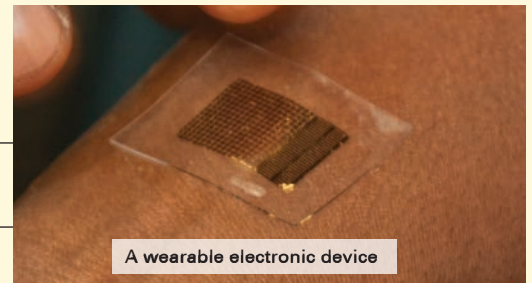
The work also opens up possibilities in the field of brain-machine interfaces for performance enhancement. Understanding the performance capabilities that could be achieved by an efficient union between brain and machine is a central theme of Coleman's research, and he envisions endless applications in areas such as military operations, gaming, education and consumer electronics. Until now, Coleman said, this brain-machine interface has been limited by the clunky, artificial coupling required by a vast array of electronic components and devices.

"The brain-machine interface paradigm is very exciting and I think it need not be limited to thinking about prosthetics or people with some type of motor deficit," said Coleman. "If you could evolve a very nice coupling [between a brain and a computer] that is remarkably natural and almost ubiquitous, I think there are applications that we haven't even imagined. That is what really fascinates me — the coupling between the biological system and the computer system."

Learn more about Coleman in a feature in the *San Diego Union-Tribune*: <http://bit.ly/tJHOCA>



Bioengineering professor Todd Coleman



A wearable electronic device



Does Your Smartphone Understand You?

Smartphone developers and users always want more out of their devices. Electrical engineering professor Gert Lanckriet thinks they ought to be able to assess your mood and play music accordingly. Going running? How about something upbeat. Relaxing and reading a book at home? Then maybe it's time for more chill music.

Lanckriet's work combines convex optimization and machine learning to automatically analyze and index very large music collections. MIT's *Technology Review* recently named him to its TR35 list of the world's top innovators under 35. He is investigating intelligent algorithms that will enable mobile phones and music players to automatically figure out what kind of music you listen to based on your location and activity.

His work promises to significantly improve how people search, discover and recommend music. A revolution in music production and distribution has made millions of songs instantly available to virtually anyone on the planet through online programs and services like iTunes. Simultaneously, the demand for music has driven the latest revolution in consumer electronics such as MP3 players and the integration of music player capability in smartphones. As a result, novel music search and recommendation technologies are poised to have a broad societal impact by helping millions of users find and organize their content.

Lanckriet's work was recently featured in the *San Diego Union-Tribune*: <http://bit.ly/qCvhtR>

New Faculty



Christine Alvarado

Lecturer with Security of Employment, Computer Science and Engineering

The conjunction of artificial intelligence and human-computer interaction; the technical challenges of building intelligent interfaces; the challenges of evaluating the effect and utility of these interfaces, and how these interfaces might provide a platform on which to enrich computer science education.

Ph.D. 2004 Massachusetts Institute of Technology

Most recently: Associate Professor of Computer Science, Harvey Mudd College, Claremont, Calif.



Todd Coleman

Associate Professor, Bioengineering

A primary goal is to use tools from information theory, neuroscience, machine learning and bioelectronics to understand, and control, interacting systems with biological and computer parts. Projects include development of multi-functional, flexible bioelectronics as well as brain-machine interface research.

Ph.D. 2005 Massachusetts Institute of Technology

Most recently: Assistant professor, Departments of Electrical and Computer Engineering and Neuroscience, University of Illinois at Urbana-Champaign



Gilberto Mosqueda

Associate Professor, Structural Engineering

Structural dynamics and earthquake engineering; experimental evaluation of large-scale structural systems under extreme loads using hybrid simulation; seismic fragility of nonstructural components and building content, seismic isolation and energy dissipation devices.

Ph.D. 2003 University of California, Berkeley

Most recently: Associate Prof., Dept. of Civil, Structural and Environmental Engineering, State U. of New York at Buffalo



Carlos F. Coimbra

Associate Professor, Mechanical & Aerospace Engineering

Solar energy, intelligent energy systems, stochastic modeling and forecasting, fractional and variable order methods, evolutionary methods, and multiphase flows/unsteady flow phenomena.

Ph.D. 1998 University of California, Irvine

Most recently: Associate Professor and founding Chairman of the Mechanical Engineering and Applied Mechanics graduate program at UC Merced



Christian Metallo

Assistant Professor, Bioengineering

Systems biology approaches to the study of metabolic pathways in mammalian cells, with a focus on understanding metabolic regulation in cancer cells and stem cells. Goals include the identification of therapeutic targets for intervention in cancer and other diseases.

Ph.D. 2008 University of Wisconsin-Madison

Most Recently: Postdoctoral Fellow, Chemical Engineering, Massachusetts Institute of Technology



Geno Pawlak

Associate Professor, Mechanical & Aerospace Engineering

Environmental fluid mechanics and coastal hydrodynamics, fluid flow over complex boundaries, generation and interaction of vortical structure in oscillatory flow across rough boundaries, near-shore water quality and its relation to physical forcing, coastal mixing processes, stratified flows and basic fluid dynamics.

Ph.D. 1997, University of California, San Diego

Most recently: Associate Professor and director, Kilo Nalu Coastal Observatory, University of Hawaii at Manoa

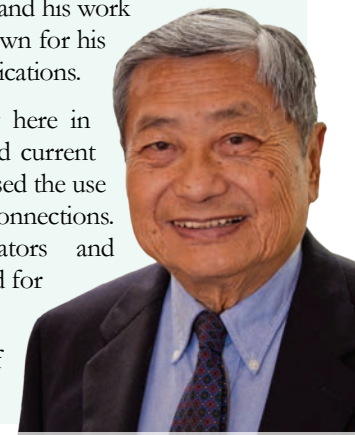
Paul Yu Named to Chang Endowed Chair

Paul K. Yu, professor of electrical and computer engineering and Associate Vice Chancellor for Research Initiatives at UC San Diego, has been named the inaugural holder of the William S. C. Chang Endowed Chair in Electrical and Computer Engineering.

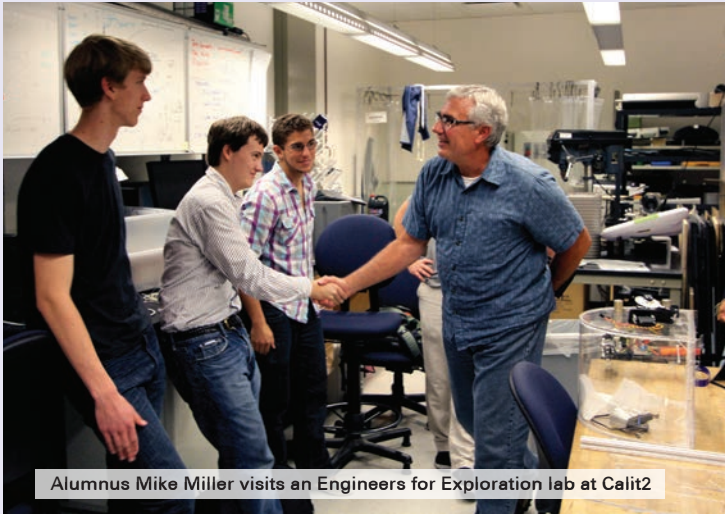
Made possible by gifts from faculty, alumni, industry and friends, the endowed chair honors William S. C. Chang, professor emeritus in the Department of Electrical and Computer Engineering. Chang founded the Electronics Devices and Materials group, and his work integrated the fields of optics, solid-state electronics and photonics. He is well known for his research on guided wave modulators and detectors used in optical fiber communications.

Yu, a pioneer in telecommunications networks, joined the faculty here in 1983. In the 1980s, he pioneered the development of low-threshold current semiconductor lasers for fiber-optic communications; and he proposed the use of surface-emitting lasers for high-density chip-level optical interconnections. He invented efficient semiconductor optical modulators and high-power photodiodes for analog fiber links commonly used for cable television and satellite communications.

Yu (left) and Chang (right) have worked together on and off for the past two decades.



Alumni Impact: Engineering Explorers



Alumnus Mike Miller visits an Engineers for Exploration lab at Calit2

Mechanical engineering undergrad James Strawson spent his summer interning for the UC San Diego-National Geographic Society (NGS) Engineers for Exploration program, working to build the next generation of remote imaging tools for National Geographic Explorers.

Strawson's internship was made possible thanks to support from Jacobs School alumni Michael Miller ('74, MS '76) and Taner Halicioglu ('96).

Miller, now the president of RUAG Space USA, recalls being inspired by the hands-on research, mentoring and lab experience he was exposed to as an undergraduate. Today, he gives back through philanthropy to ensure that current students have similar opportunities.

"The real-world experience provided at the Jacobs School and Calit2 is critical to retain and engage our students, and prepare them for the future," Miller said.

San Diego divisions on special programs, including Engineers for Exploration, which is co-directed by Jacobs School alumnus and Calit2 research scientist Albert Yu-Min Lin ('04, M.S. '06, Ph.D. '08) and computer science professor Ryan Kastner.

To learn more about how private support to the Jacobs School of Engineering can make a difference, contact Lisa French at (858) 246-0593 or lfrench@ucsd.edu

The National Geographic Society partners with Calit2 and other UC

Jacobs School: There's an App for That

Looking to reconnect with former classmates, to find out about alumni events in your area, or to learn the latest news and research from the Jacobs School? Now you can do all this on your smartphone or iPad. Download the free Jacobs School app from iTunes and the Android marketplace (search for "UCSD Jacobs"). A special thanks to alumnus John van Zandt ('76, '79, '86), President of CEO Softcenters, who developed the apps.



Class Notes



Peter Nguyen

B.S. Electrical Engineering 1988,
M.S. Materials Science 2006, Ph.D. 2011

Bitwave Semiconductor

I've been working as an engineer at Bitwave Semiconductor company in Mass. I support my team to configure and verify the soft transceiver chipset for 3G/4G technology. It is a kind of software-defined radio (SDR).



Filippo Menczer

Ph.D. CogSci & Computer Science 1998

Professor of Informatics and Computing, Indiana University

I was promoted to full professor in the School of Informatics and Computing, Indiana University, Bloomington. <http://cnet.indiana.edu/people/filippo-menczer>.



Matthew Moore

B.S. Computer Science 2005
Co-Founder & CTO, CrowdMob Inc.

Closed an angel and venture round for our new company called CrowdMob Inc. We are bringing real-time redemption, virality and loyalty to the local deal world. We are looking for great hires too.



Arwa Kassamali

B.S. Bioengineering 2006

Research Engineer, General Atomics

Over the past five years, I have worked with multiple divisions in projects related to manufacturing, quality, operations, R&D and supply chain. I am currently on a project to design enhancements to the Diagnostics Instruments. I am currently pursuing my Executive MBA.



Ricardo Rubalcava

B.S. Chemical engineering 2006

Environmental Coordinator, BAE Systems

During the past five years I have worked exclusively in the environmental field. Major projects I have managed include industrial facility closures, facility layout design, hydrocarbon remediation and developing an environmental management system.

This past July my wife Donna gave birth to our first child, Maceo. When it comes time for him to choose which college to attend, I hope he makes the smart choice and selects the UCSD Jacobs School of Engineering. His first step to a bright future.



Aaron Sathrum

M.S. 2006, Ph.D. 2011 Materials Science

Research Engineer, General Atomics

I recently completed my doctoral research on solar-based fuels at UC San Diego. We celebrated by taking a trip to China. I plan to continue developing large-scale electrical energy storage systems for electric vehicles, smart grid and renewable energy applications. I am

married to Jenny Sathrum (formerly Adams) UC Davis '03. I now work at General Atomics in La Jolla and live in San Diego.



Rivan Paulos

B.S. Electrical Engineering 2010

Firmware Engineer, Western Digital

Since graduation, I have been working for Western Digital building drives and firmware; and I test them with state of the art tools. At the same time, I started my third business in retail.

Matt Leshaw

B.S. Structural Engineering 2009

After working in the aerospace industry at San Diego Composites for a year after graduation, I have decided to return to school to pursue a medical degree. I recently sent out applications and am hoping to hear back regarding interviews sometime in January. Can't wait to wear my Jacobs School T-shirt on my first day of class.



Fontaine Shu

B.S. Computer Science 2006

Sr. Web Developer, SweetLabs, Inc.

I started working with this cool startup based in downtown San Diego called SweetLabs this past March. I create HTML5/CSS3/JavaScript web applications for our Pokki platform. Pokki just recently launched at the Future of Web Apps conference. So far it has gotten a lot of good press and our development community is growing.



Ryan Griswold

B.S. Structural Engineering 2008

Development Engineer, UC San Diego, MAE Dept.

I'm back at UCSD working in the MAE department. I work for professor Nemat-Nasser as a Development Engineer. We are working on a lot of exciting projects right now ranging from designing materials with controlled band structure to investigating

shockwave mechanics and material response to shockwaves. I get to work alongside Jon Isaacs who is a fantastic experimentalist and has been generous in sharing his extensive knowledge with me. I am enjoying the work here and am glad to be back on campus.



Gopi Tummala

M.S. Computer Engineering 2011

Design Engineer, Qualcomm

I started to work at Qualcomm in San Diego.

Vincent Phillips

B.A. Computer Science 1983

Chief Technology Officer, Copart

I am running technology and products for the largest on-line auto auction.



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