Punchd, a clever smart phone application, packed quite a punch in the news this summer when it was acquired by Google. It offered consumers an ingenious digital version of the ubiquitous buy-10-get-one-free loyalty cards, and it tied in well with Google's payment products, like Google Wallet.

And perhaps the coolest thing about the deal was that Punchd was created by Cal Poly students. Reed Morse (Computer Science '10) and Grant-land Chew (Computer Science '10) began working on Punchd a year and a half ago in an Android development class at Cal Poly taught by David Janzen, an associate professor of Computer Science and Software Engineering. The duo's class project carried over into a senior project, which then turned into the six-person business that was purchased by Google whole cloth — the deal included keeping the team intact to continue working full-time on the project.

It's an engineers-as-entrepreneurs success story that reflects a larger, if quieter, groundswell of innovation taking place throughout campus. It's a movement that Cal Poly Engineering is actively embracing with the launch of its Innovate by Doing initiative.

After a year-long national recruitment, Debra Larson joined Cal Poly Engineering as dean last August. Self-described as “heart and soul an engineer,” Larson was influenced by growing up near Michigan Tech: “My early impressions of seeing Tech students outside running survey equipment helped cement the idea that I could have a career solving problems while being outside.”

After earning her bachelor's and master's degrees at Michigan Tech, Larson worked as a civil and structural engineer in manufacturing, product development and consulting. A job with Trus Joist, a division of Weyerhauser, gave her the opportunity to work in product development and research, which led her back to college for a Ph.D.

Doctorate in hand, Larson joined the faculty at Northern Arizona University (NAU), where she served almost 20 years as a...
Bert and Candace Forbes have had a huge impact on Cal Poly Engineering. In 1976, the couple founded Ziatech, an applied computing solutions supplier and manufacturer. A suggestion from a Cal Poly engineer brought the fledgling company to San Luis Obispo in 1979, where Ziatech cemented its reputation as an industry pace-setter. In 1994, the U.S. Small Business Administration named it Central California Small Business of the Year. The company was acquired by Intel in October, 2000.

The Forbes credit Ziatech’s success to a pioneering spirit that fosters innovation and to “top-notch” employees, hundreds of whom have been Cal Poly Engineering graduates.

In 2001, they established two endowed professorships and a fund for equipment and laboratory upgrades for Computer Engineering, Computer Science and Electrical Engineering.

The Forbes Professorships have allowed the college to recruit exceptional academic leaders. This fall, Forbes Professors Bridget Benson and Foaad Khosmood joined the faculty, Benson in Electrical Engineering and Khosmood in Computer Science and Computer Engineering (CSC/CPE). Both earned their bachelor’s degrees in Computer Engineering at Cal Poly.

See Page 19 for more on the Forbes Professors.

In 2008, John and Connie Nielsen provided a grant to establish the Mustang ’60 Projects Shop. Three years after making their original gift and watching the development of the shop, they decided “one gift was not enough.” This year, they gave an endowment to fund the position of the Mustang ’60 shop technician.

Nielsen, a 1964 Mechanical Engineering graduate, said, “The shop technician, Eric Pulse, provided a layout and acquired the tools and technology to make Mustang ’60 state-of-the-art. The facility now allows students to bring their design and projects to life – it’s a core piece of Learn by Doing for the entire college.”

The endowment fund ensures that technicians like Pulse are always available to keep the shop well-maintained and provide support for student projects.

Northrop Grumman representative Kerri Bennett, sixth from left, presents a $1,000 check to the Cal Poly Society of Hispanic Professional Engineers as part of a $28,000 gift to the College of Engineering. The Northrop Grumman gift also went to the Society of Women Engineers, the Human Computer Interaction Lab, Women in Software & Hardware, the Society of Black Engineers & Scientists, the American Indian Science and Engineering Society, the Institute of Electrical and Electronic Engineers, the Society of Mechanical Engineers, Design-Build-Fly, Cal Poly CubeSat/Satellites and other senior projects.
Debra Larson. “It’s a natural fit. Learn by Doing is who we are — and Learn by Innovating only adds more dimension to what we do.”

“There could be no better time than now to create an ecosystem of innovation to promote new opportunities in interdisciplinary and project-based learning and to tap the exponential powers of being a polytechnic institution,” she said.

Whether Cal Poly Engineering graduates work for themselves or for big business, one thing is clear: they will need to be able to work in teams, create ideas and know how to maximize traditional and non-traditional industry resources to accomplish their goals. Being “industry ready” in today’s world means evolving from single-discipline solutions to applying diverse knowledge in new ways.

“We must be opportunity-ready and problem-centric, rather than discipline-specific,” said Larson.

Until recently, Cal Poly lacked a focal point for nurturing innovators. Now it’s an emerging hub of innovation and entrepreneurialism, with programs that attract students, local and state businesses and industry partners. Among its current crop of resources:

• The Center for Innovation and Entrepreneurship is the overarching, universitywide support program for student entrepreneurs at Cal Poly who are looking to connect with business leaders and community members, enhance their educational experience and ultimately prepare themselves for the work they will be entering after graduation.

• The California Central Coast Research Partnership (C3RP) is a gateway for companies looking to engage faculty and students in applied research and development or to use specialized laboratories and facilities.

• Cal Poly Technology Park, or Tech Park, is a new home for technology-based companies, yielding benefits such as easy access to student employees as well as opportunities to partner with Cal Poly in applied research and development projects, grants and contracts.

• Innovation Quest provides funding for innovation — no strings attached. The non-profit, philanthropic corporation was founded by successful Cal Poly graduates and business leaders interested in giving back and enhancing innovation at the same time.

• Cal Poly Small Business Development Center for Innovation has a twist — it focuses on technology-based businesses, and it’s the first business de-
Cal Poly Engineering Top-Ranked — Again

For more than a dozen years, Cal Poly has ranked among the nation’s very best engineering colleges. The annual U.S. News & World Report “Best Colleges” guidebook released on Sept. 13 again named Cal Poly number two in the nation for public, largely undergraduate engineering programs.

Mirroring the 2011 rankings, the U.S. Military Academy was the only “public” institution listed ahead of Cal Poly this year, while Cal Poly shared the No. 2 ranking with the U.S. Naval and Air Force Academies.

“Frankly, it’s a bit of a stretch to put Cal Poly in the same category as the U.S. Academies because the relative levels of public access and government support are so different,” notes Cal Poly Engineering Dean Debra Larson. “So, I think the rankings actually place Cal Poly at the top of its class.”

Among both public and private institutions, Cal Poly was ranked seventh in the nation.

Asked why Cal Poly consistently lands in the top tier of engineering programs, Larson said, “It’s about Learn by Doing basics: exceptional students and a great faculty focused on student learning and student projects. We see the manifestation of this educational dynamic in unique and world-renowned hands-on projects like our CubeSat program, which gives students the experience of designing small satellites and launching them into space.

“Another Learn by Doing outcome is reflected in the winning records of our engineering student teams — for example, Cal Poly just swept the American Institute of Aeronautics and Astronautics (AIAA) design competition, winning first, second and third in both the undergraduate and graduate divisions.”

Explaining that U.S. News bases its rankings on peer reviews, Larson said, “In addition to our student teams, Cal Poly is known to be favored by industry recruiters — our graduates are highly sought-after employees.”

A number of College of Engineering programs ranked high in the Best Undergraduate Engineering Programs in their individual specialty categories. The university’s Computer, Electrical and Mechanical Engineering programs were each ranked as the top program at a public university in their respective specialty categories. Cal Poly’s Civil and Environmental Engineering program was ranked the second best program at a public university.

Cal Poly as a whole also holds an unprecedented record in the U.S. News rankings: 19 years as the best public-master’s university in the West. Cal Poly ranked seventh in the magazine’s overall list of the West’s best universities, including both public and private institutions that provide “a full range of undergraduate and master’s-level programs but few, if any, doctoral programs.” U.S. News ranks colleges that grant doctoral degrees, such as those in the University of California system, in a separate category.

The U.S. News college rankings are available at www.usnews.com.

NSF Grant Expands Research Capability of Cal Poly’s Global Waste Research Institute

Cal Poly’s Global Waste Research Institute (GWRI) was recently awarded a $372,000 grant from the National Science Foundation (NSF) to acquire an Optical Interferometry System to help research and analyze material surface characteristics for a variety of civil engineering, bio-medical, manufacturing, micro-electromechanical, and aerospace engineering applications.

Part of the grant will allow GWRI to acquire a Bruker Nano Inc. OM-NPFLEX 3D Metrology System and associated accessories for Cal Poly’s College of Engineering. The technology provides capability for surface characterization for novel investigations of civil engineering systems, including interface shear behavior of layered systems, soil-structure interaction and discrete inclusions in composite systems.

“The interferometer will provide extensive research capabilities at Cal Poly, creating opportunities for interdisciplinary collaborations for advancing surface topography analysis and the engineering performance of materials,” said GWRI’s Director Dr. Nazli Yesiller. “We’ll be able to greatly improve our understanding of the mechanics and micromechanics associated with applications in civil engineering and other technical fields, which will lead to potentially transformative advances in interface and fiber inclusion analysis, and pre-, in-, and post-service analysis of materials that will be integrated into learning modules for use throughout the curriculum at Cal Poly.”

GWRI is a collaborative effort between Cal Poly and industry to promote the development of sustainable waste and by-product management technologies and advance current practices in resource management.
Fresh Faces: Cal Poly Engineering Welcomes Class of 2015

Preliminary statistics for the first-year engineering students matriculating at Cal Poly this fall indicate that the class has all the metrics for success:

- Average High School GPA: 3.94
- Average SATs: 683 math; 616 reading
- Applied: 9,434 • Selected: 3,505 • Enrolled: 1,292

The numbers, however, only tell part of the story. Engineering Advantage took a closer look at just three of the fresh faces at Cal Poly Engineering, and found individuals marked by optimism, discipline, a sense of purpose and belief in their ability to impact the world in positive ways.

Juan Pablo Quinonez Weston — Computer Science

A Peruvian native, Juan Pablo Quinonez Weston fast-tracked his way to Cal Poly through a highly supportive network of family and friends, together with programs like the Summer Institute and Advancement Via Individual Determination (AVID).

“I grew up in Peru with my mother and her family,” recounts Weston. “When I was 16, my father invited me to come live in San Diego. I arrived speaking so little English that I had to use signs to communicate even at my father’s home.

“At the time, I took essay and math tests to determine my academic equivalency. I aced the math, but there are no essay tests in Peru! So, starting high school in San Diego as a sophomore, I loaded up on ESL classes, and by the end of the year, passed the ESL exam — by one point. More important, I was accepted by AVID and it set me on the journey that took me to Cal Poly.

“I’m new to computer science. I chose it based on my research and my mom’s example. While I was still in high school in Peru, she was the head of banking security, and I watched her teach herself how to program. I also find math really fun and am thinking about a double major.

“I like to stay active. I’m a tennis enthusiast and love to dance — I’m already a member of the Salsa Club. And among the academic clubs, the White Hats looks interesting.

“I’m very social but I also like to do things on my own. I’m driven to master everything I do. Learn by Doing — that’s me. My junior year I toured a number of campuses and came to the conclusion — Cal Poly is for me.”

Elizabeth Guzman — Computer Engineering

Elizabeth Guzman has never owned a computer, but that hasn’t stopped her forward trajectory.

Born the oldest of four children in Guadalajara, Guzman was sent to live with her grandparents in Lynwood, Calif., at 14. Her parents made the painful decision because of the economic strains of caring for her baby brother who suffered from Down’s Syndrome.

“My brother is my inspiration,” Guzman noted. “I was just a kid, but I understood that all I could do to help my family was to try to improve my future.”

In California, she faced the challenges of adjusting to a new country and a different language, while feeling largely alone. Her grandparents, though devoted, were immersed with work and the responsibility of caring for Guzman’s terminally ill aunt. “I had to do most things on my own — cooking, laundry, cleaning — but I now feel it made me a stronger person,” she said.

Starting with English learning classes as a high school freshman, Guzman saw her language skills accelerate in her sophomore year as she began reading widely. By her senior year, all of her classes were advanced - and she was meeting people who shared her love for computers.

Another catalyst in high school was MESA, the statewide Math, Engineering, Science Achievement program aimed at first-generation students.

“It encouraged my interests, challenged me to enter competitions and helped me grow. I was told you are prepared for college if you know how to learn — and I love to learn, to discover new ideas and open my mind to new possibilities. I want to be a woman who is self-reliant and can meet any challenge. I will try my best to perform at the level of my peers here. Cal Poly is a dream come true for me.”

Alex Baucom — Mechanical Engineering

In high school, Alex Baucom garnered a slew of academic, sports and leadership awards, but his recent honor as a recipient of a Buick Achievers Scholarship has him really revved up.

The scholarship recognizes 100 college-bound students from throughout the U.S. who excel both in the classroom and the community. Honorees receive up to $25,000, renewable for up to four years.

“It was quite a wow,” said Baucom. “My brother is in junior high and my sister is an eighth-grader, so there will be more of my parents’ college savings to share with them because of the scholarship.”

“I have a passion for robotics — I got the LEGO Mindstorms Robotics invention system when I was 10. I don’t know what area of robotics I want to work in but I know that I want to work in an area that will help make a difference in people’s lives. I learned about the campus chapter of Engineers Without Borders, which is something I’d like to explore.

“I chose Cal Poly because it has a reputation for being one of the best engineering schools. What I especially like is its mechatronics concentration, which means I can pursue my interest in robotics right away, as an undergraduate.”

Baucom’s life includes challenge: he has a rare blood disorder called ITP, which causes easy bleeding and associated health complications. For many, the disease means curtailing high-impact, hard-driving activities, but Baucom never recognized his condition as a barrier. “I weigh the risks; I’m mindful, but it doesn’t stop me from giving my all,” he said.

And with an exceptional background of leadership, scholarship and sense of purpose, Baucom will be giving his all as one of Cal Poly Engineering’s newest generations.
The 2011 EPIC (Engineering Possibilities in College) camp for high school seniors sponsored by Cal Poly Engineering included 140 students from all over the country. EPIC students attend eight hands-on labs throughout the week. Labs are offered in aerospace, architectural, biomedical, bio-resource & agricultural, civil, computer, electrical, environmental, industrial, manufacturing, materials, mechanical and software engineering. For information on the 2012 EPIC Camp, see https://epic.calpoly.edu.

Goodrich Helps EPIC Grow Younger

The Goodrich Foundation has donated $15,000 to Cal Poly to introduce a new generation of students to engineering and technology through the school’s innovative Engineering Possibilities in College (EPIC) program.

Now entering its sixth year, the one-week summer program, previously limited to high school students, will expand its reach in 2012 to include middle school students. EPIC will use the money to develop lab activities specifically designed to engage middle school students in science, technology, engineering and math.

“EPIC offers students the fun of summer camp, the inspiration of a university setting and the opportunity to explore what their future might look like,” said College of Engineering Dean Debra Larson. “It’s a highly participatory, Learn by Doing environment where they can explore a range of interests and gain confidence in how they might fit into the exciting world of engineering and technology.”

Cal Poly SWE Chapter Repeats History

Cal Poly Society of Women Engineers (SWE) again set the “gold standard” for university SWE chapters across the nation at WE11, the Society’s Annual Conference, October 13-15 in Chicago.

Cal Poly brought home the Gold Award as the nation’s top Outstanding Collegiate Section, and repeated history with two teams that tied for first in the Team Tech competition.

The Team Tech competition involves a year-long, multidisciplinary, industry-sponsored project. One of the Cal Poly SWE teams worked with Santa Maria-based Atlas Copco Mafi-Trench on a compressor wheel cooling system. The other team designed a prosthetic attachment to aid amputees when climbing stairs. The group worked with the Quality of Life Plus (QL+) Foundation, a nonprofit group that fosters innovation to improve the quality of life for those injured in the line of duty.

Natalie Lacey, a Biomedical Engineering senior and co-captain of the prosthetic knee lift project, gave her explanation of why Cal Poly continues to dominate the competition:

“Being a part of a project from the original conception all the way through to a prototype
Larson

From Page 1

civil and environmental engineering professor, department chair and associate dean. Her years spent as a professional engineer, however, not only influenced her teaching but also informed her contributions to engineering education.

Larson led faculty members and industry partners to create “Design4Practice,” a multidisciplinary curriculum that is now a core element of engineering programs at NAU. Design4Practice earned the team the Boeing Outstanding Educator Award. Larson’s most recent appointment was associate vice provost at NAU.

Cal Poly President Jeffrey D. Armstrong noted that Larson “. . . knows that Cal Poly’s primary mission is undergraduate education, that our highest priority is student success, and that Learn by Doing is an integral part of the Cal Poly experience.”

For her part, Larson believes she is “privileged to be empowered as the incoming dean to contribute to the creation of engineering solutions to the challenges we face as a society.”

Q&A with Dean Larson

Engineering Advantage: You’ve held a variety of university administrative positions including dean and provost. What is your philosophy about the position of dean?

Debra Larson: First and foremost, the dean must establish a sense of community. I believe a dean should be accessible and collaborative. The dean needs to work with faculty and staff to collectively build a future for the college by empowering grass roots ideas and sculpting a vision from that. In 16 years at Northern Arizona University, I had seven deans. I learned that it is important to have a dean who is engaged and who tries to do the right thing for the college. When a dean becomes distracted, the college loses focus and ultimately loses ground. Above all, the college is about the students – the dean and faculty must ensure that we provide quality learning experiences.

Why were you interested in becoming dean of Cal Poly Engineering? What excites you about coming to Cal Poly?

For years, I have known Cal Poly as a place that gets engineering education right. Its mystique is founded on great students, who benefit from great teaching, a high quality learning environment and, of course, Learn by Doing. This formula leads to fantastic baccalaureates, who are sought-after by industry. Now I know why Cal Poly wins national design competitions over and over! Design-build-test is part of its educational DNA. Who would not relish the opportunity to lead such a dynamic institution and help improve its standards of success?

How do you propose building on the success of Cal Poly Engineering?

I think we can lead engineering education by synthesizing, organizing and branding the college’s pedagogical and curricular Learn by Doing approaches using the framework of multidisciplinary design and innovation. Let’s hardwire the award-winning student projects into the curriculum – class projects, club team projects and multidisciplinary team projects all provide opportunities for students to innovate. In fact, innovation is key to graduating engineers primed to charge the economic engine, serve existing and emerging industries, and address societal needs. Innovate by Doing is the next evolution of Learn by Doing.

Do you have other strategic initiatives for the college?

Absolutely! The department chairs and I have begun identifying how the college will address the strategic imperatives outlined by President Armstrong. Those imperatives include: Develop whole-system thinkers; embrace the teacher-scholar model; foster cultural competency in a global context; promote a culture of support, philanthropy and community engagement; achieve sustainable growth and support world-class facilities; and ensure our financial future.

Our ideas have coalesced around a number of proposals that we’ll be taking on the road to supporters and industry partners. They include establishing the Expressive Technologies Studios in conjunction with the College of Liberal Arts. We also hope to work with the College of Science and Mathematics to found a facility for modeling, simulation and visualization. The center will enable cross-cutting research in aerospace engineering, life sciences, materials, intelligent transportation, mechanical systems, industrial processes, coastal ocean modeling and more.

An Engineering Innovation Center would foster innovation and collaborative problem-solving that addresses human needs worldwide. And it’s time that we provide a cutting-edge space for our students to design and construct their project prototypes and build fully-functioning inventions.

By founding endowed faculty positions in focused areas, we can reduce our financial dependency on the state and establish Cal Poly as a leader in vital, cross-disciplinary and emerging areas such as sustainable energy and electric propulsion, biomedical engineering and cybersecurity.

We’ll be developing these and other initiatives that strengthen Cal Poly Engineering, serve students and provide a model engineering education for the 21st century.
Industrial Engineering Student Employee is Best in the West

Robby Nielsen, student technician for Cal Poly’s Student Project Lab and Mustang ’60 machine shop, is Best in the West among state and regional student employees.

The Industrial Engineering student won the Cal Poly Student Employee of the Year Award, the Northern California Student Employee of the Year Award, and the Western Regional Student Employee of the Year Award. He also placed second in the National Student Employee of the Year competition.

“Robby is an outstanding innovator and take-charge person who has created safer, more efficient and more widely accessible labs and machine shops,” said George Leone, technician and technician staff supervisor for the Mechanical Engineering Department. “Not to mention that Robby’s work has resulted in savings of thousands of dollars,” he added.

Since coming on board in 2008, Nielsen has initiated a broad range of programs such as creating classroom and online professional development programs for student technicians, developing new systems for inventorying and scheduling, and revitalizing campus and community outreach efforts.

“Making project-based learning safer, more accessible and more fun for students is my proudest achievement,” said Nielsen. “And it has all been possible because of the freedom, encouragement and guidance I receive from some amazing bosses – Eric Pulse and George Leone – and an incredibly dedicated staff of student techs.”

“Ultimately, I want to help make Cal Poly’s project labs and operations a model for other schools,” said Nielsen.

In the Pink

Behind these masks are Cal Poly Electrical Engineering students Jason Lumanlan, Greg Chavoor, Gavin Lee and Neel Lal. They and Professor Xiaomin Jin (second from right) suited up for lab work on a project involving GaN LD/LED device level modeling and simulation, fabrication, testing and control system design for the design and implementation of a new class of efficient and intelligent lighting systems. What makes the project even more notable is that it is part of an educational collaboration between Cal Poly and Peking University – the lab pictured here is located in Beijing, China. The three-year project was made possible by a $150,000 National Science Foundation grant awarded to Electrical Engineering Professors Xiaomin Jin and co-investigator Xiaohua (Helen) Yu.

Mechanical Engineering Student Awarded NSF Graduate Research Fellowship

Kevin Yamauchi, a master’s candidate in Cal Poly’s Biomechanics Program has been awarded a National Science Foundation Graduate Research Fellowship worth $90,000 over three years.

The competitive fellowship was awarded to 2,000 students nationwide this year, three being from Cal Poly. Yamauchi selected Cal Poly for his post-graduate work; chemistry grads Crystal Valdez and Joseph Carlson are pursuing advanced degrees at UCLA and UC Irvine, respectively. The NSF program supports graduate students who have demonstrated their potential for significant achievements in science and engineering research.

Yamauchi’s research will focus on the properties of articular cartilage as it relates to treatment of osteoarthritis. The knowledge gained will aid in devising new tools, strategies and therapies to improve musculoskeletal tissue repair and regeneration. “My interest is in how mechanical engineering concepts apply to complex systems in the body,” he said. “Osteoarthritis is a prevalent disease affecting almost 30 million Americans, with no treatment thus far. It’s an area of study that poses significant and unsolved challenges.”

Kevin Yamauchi was awarded an NSF fellowship.

Yamauchi, who holds a bachelor’s degree in Mechanical Engineering, credits Cal Poly for uniquely preparing him for this new frontier.

“For one thing, I am used to being exposed to new challenges on an ongoing basis,” he said. “Every project ushers in new people, new equipment and the different vocabularies of an interdisciplinary team. And especially valuable is how the college exposes students to the research world, even as undergraduates. For the past two summers, I had access to research facilities at UC San Diego as part of Cal Poly’s collaborative relationship with that research university. As a result, I already know what it is to carry out, document and communicate research in a professional lab setting.”

Another “incredible influence” on his research interests was service learning. Last year, he was part of a five-member interdisciplinary team project to develop a low-cost prosthetic foot for a Honduran clinic. The multidisciplinary effort involved Mechanical Engineering, Materials Engineering and Biomedical Engineering students.

Yamauchi looks forward to magnifying that kind of impact — under the microscope of the research lab.
Cal Poly Engineering Announces Outstanding Graduates for 2011

Computer Engineering senior Scott Marshall was recognized as the topmost graduating senior for academic excellence. Marshall earned a 4.0 GPA, including 11 quarters in which he had perfect 4.0’s. After an internship at NetApp last summer, he enrolled in graduate school at UC Berkeley.

Honored as the top graduating master’s degree students were Mathew Clark, Shane Fleshman and Jonathan Lichtwardt.

Clark (Civil and Environmental Engineering) focused his studies on geotechnical engineering. As an intern at the Oak Ridge National Laboratory, Fleshman (Biomedical Engineering) researched and developed a conceptual design for an implantable microelectrode device that assesses liver transplant viability. While at Cal Poly, Lichtwardt (Aerospace Engineering) participated in a NASA-sponsored project to design a cruise-efficient, short take-off and landing aircraft.

The Outstanding Graduating Senior for Contributions to the College of Engineering was Anna Hopper (Industrial Engineering), who represented the college as a Cal Poly Engineering Ambassador. She received an Outstanding Women in Engineering Award from the Cal Poly Society of Women Engineers.

The Outstanding Graduating Senior for Contributions to the University, Kyle Struthers (Biomedical Engineering), served on Poly Reps, the Associated Students Inc. board of directors, the Society of Women Engineers and the Biomedical Engineering Society.

Eric Jorgensen (Materials Engineering) was named the Outstanding Graduating Senior for Service to the Community. As a freshman, Jorgensen worked with a student team to install a storage system at the Oak Park Recreation Center, an after-school program for underprivileged children in Paso Robles. He then became involved with One Heart Source, an aid organization that provides HIV prevention and community development in Tanzania. Now conversant in Swahili, Jorgensen has become a top organizer for the national organization.
Cal Poly Earns Innovation Award at Shell Eco-Marathon

The Cal Poly Urban Concept Car Team drove off with a prestigious award for technical innovation and a third-place overall finish in its category at the 2011 Shell Eco-Marathon in Houston, Texas, on April 17.

Boasting sophisticated metering electronics that generated an unprecedented amount of performance data, the Cal Poly car went 425 mpg to finish third behind winner Louisiana Tech (646 mpg) and second place Mater Dei High School (586 mpg).

Faculty advisor Joe Mello credited the onboard electronics plus new composite wheels with Cal Poly winning the Southwest Research Institute Technical Innovation Award. “It was the combination of overall technology that made our car stand out,” Mello said. “It was an outstanding job by a true multi-disciplinary team.”

Team leader Gabriel Mountjoy was equally enthused. “The team had a great time at the Shell Eco-Marathon this year,” he said. “We did much better than last year and were much better prepared. We ran into problems, including dropped chains and steering issues, but we were able to fix them all.”

As opposed to Cal Poly teams in the past competing in the Prototype category with sleek, wind-tunnel tested cars that get astonishing mileage, the Cal Poly Engineering students switched to the Urban Concept competition, which focuses on more roadworthy fuel-efficient vehicles.

“It’s a new set of challenges and our car performed well. Since our team is very young, we’re excited about the future,” said Mello.

Mountjoy agreed: “We were able to throw a ton of new electronics into the car that impressed everyone. I would not be surprised if future teams try to match our electronic system.”

The Shell Eco-Marathon challenges college and high school student teams from around the world to design, build and test energy efficient vehicles. The winners are the teams that go the farthest distance using the least amount of energy. For more information on the Shell Eco-Marathon, see: http://www.shell.com/home/contentecomarathon/

Students’ Project Will Help Train PG&E Operators at Diablo Canyon

The complex skid of pipes and tanks sitting outside the Bonderson Projects Center is a Flow Loop Simulator developed by Cal Poly students to help train operators at PG&E’s Diablo Canyon Power Plant (DCPP).

The project to develop the simulator was brought to campus last year by Mechanical Engineering (ME) Professor Chris Pascual and continued this year as a senior project under the direction of ME Professor James Widmann.

ME students John Abruzzini, Manuel Carrasco, Neil Sutherland and Elise Woolworth worked this year to verify, enhance and implement the schematic diagram proposed by the 2009-2010 team.

Currently, DCPP technicians, operators and engineers train on computer simulations. The goal of the Cal Poly project is to provide hands-on experience with the operation of a thermal/fluid as well as the system response to failures in control and instrumentation.

According to the project report, the simulator is “comprised of components and instrumentation typically found on a thermal/fluid system: pumps, tanks, heat exchangers, isolation valves, control valves, pressure transducers, temperature transmitters, and flow meters.”

“The project is a huge undertaking,” said Widmann, “but this year’s team moved the project forward by completing the design of the flow loop simulator and providing clear documentation for future design teams.”

Engineering Students Win National ASHRAE Design Competition

Cal Poly Engineering won first place in the Heating Ventilation and Air Conditioning (HVAC) System Selection category of the 2011 student design competition held by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE).

This year’s competition involved selecting and designing the HVAC system for the Drake Well Museum in Titusville, Pa., site of the world’s first oil well in 1859, which launched the modern petroleum industry.

The Cal Poly team included students Lynn Gualtieri, Evan Oda, Kristin Porter, Navid Sairidnia, Jeffrey Wong and Cameron Young; faculty advisor was Jesse Maddren. Cal Poly’s entry was among more than 20 submittals from around the world.

The winning entry emphasized green and sustainable design and included a solar panel array that would offset approximately 95 percent of the energy consumption of the museum. According to the Cal Poly presentation, the group’s design was guided by ASHRAE standards to exceed LEED minimum requirements and Energy Star score expectations, both of which comprise industry sustainability indexes.

The first-place teams will present their projects at the 2012 Winter Conference in Chicago, Jan. 21-25.

ASHRAE, founded in 1894, is an international organization of some 50,000 persons. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

For full results, see: http://news.thomson.net/companystory/ASHRAE-StudentCompetition-focuses-on-HVAC-R-and-building-design-600844

Students used a magnetic base drill press to drill pump base holes for the simulator.
Flush with Victory

Cal Poly wins second straight national concrete canoe title with boat made of recycled toilets

Cal Poly claimed the “America’s Cup of Civil Engineering” for the second consecutive year at the American Society of Civil Engineers National Concrete Canoe Competition on June 18. The school edged out 22 other universities from the U.S. and Canada with a 208-pound, ocean-themed canoe made from concrete and recycled toilets – The Cetacea.

The 24th annual regatta, sponsored by the American Society of Civil Engineers (ASCE), was hosted by the University of Evansville in Evansville, Ind. The four-part competition included an oral presentation, written report, judgment of a canoe’s aesthetics, and sprint and endurance races.

The event is designed to challenge students’ knowledge, creativity and stamina, while showcasing the versatility and durability of concrete as a building material. Competition rules this year included a strong focus on sustainability. Cal Poly’s innovative response was to include recycled porcelain from toilets.

“The toilet aggregate surprised a lot of people,” said Project Captain Chad Inlow. “We wanted to do something unique. We brainstormed possible solutions for more than two weeks and then the idea of using recycled toilets occurred to me.”

The white porcelain was a good match for the boat’s white concrete and also kept 600 pounds of porcelain from going into a landfill.

“Another ‘wow’ factor was the 3-D detailing on the canoe,” said Mix Captain Danielle Steinmetz. “We had a beautiful boat last year, and wanted to produce a design that would combine a winning look with winning in the water and all the other categories.”

Inlow credits this year’s repeat success to an abundance of hard work by team members, and Cal Poly’s practice of sharing hard-earned lessons, knowledge and extensive documentation with the next team. “We are willing to work harder than anyone else – but our dedication to passing down information from year to year is a really big part of it, too.”

Western Digital Finds a Return on Investment in Student Projects

For the past three years, Western Digital (WD), the world’s largest hard drive manufacturer, has provided more than $350,000 and collaborative support for projects that have given students a chance to participate in applied research and learning in disk drive performance, testing technologies, workload measurements and thermal design.

In return, WD has recruited new employees, facilitated low-cost research and established a pipeline of new engineers prepared to make advancements in the hard drive industry.

The fruitful relationship between Cal Poly Engineering and Western Digital began in 2007 when David Renaurt, WD’s director of new product introduction and a 1984 Cal Poly Mechanical Engineering graduate, proposed that the company and the college collaborate. “At the time, WD was largely made up of dinosaurs – guys that had been in the business for 10 to 15 years,” said Renaurt. “We needed to attract smart young engineers, especially since disk drive technology is growing in size.”

The company also had a need for applied research projects, the kind that Renaurt knew would make excellent Cal Poly Learn by Doing projects.

The first Western Digital projects were initiated in 2008; since then, faculty and students from Industrial and Manufacturing Engineering, Computer Engineering, Electrical Engineering and Computer Science have participated.

Projects this year include improving forecasting models for designing hard drives; creating computer visualization for identifying problematic workloads for hard drives in order to help improve reliability; and capturing enterprise-level hard drive workloads and providing analysis and data mining tools.
Cal Poly Engineering Teams with Winning Teams in AIAA Aircraft Design Competition

Cal Poly Engineering’s Aerospace teams flew circles around the competition in not just one but two design events at the recent American Institute of Aeronautics and Astronautics (AIAA) student design contest.

The AIAA Foundation announced Sept. 9 that Cal Poly swept first-, second- and third-place awards in both the Undergraduate Team Aircraft Design Competition and the Graduate Team Aircraft Design Competition.

In the undergraduate contest, for which teams were required to design an innovative heavy-lift hybrid air vehicle, the top prize went to Cal Poly’s Mustang Aerospace team. For the graduate student competition, which called for an electrically powered aircraft, Cal Poly’s VoltAir team blitzed the competition with The BLITZ Electric Aircraft. The teams were under the direction of faculty advisor Bruce Wright, joined by Bill Durgin for the graduate competition.

“I think the fact that just five of us were able to design — in detail — nearly every aspect of a radically new airplane in just a matter of months was really the most impressive part of the whole competition,” said Matt Handfelt, team lead for the The BLITZ. “We would definitely like to take the design further someday — once battery technology catches up to where we would like it to be.”

Following graduation in June, Handfelt joined Northrop Grumman in San Diego working on an unmanned aircraft. For the undergraduate team competition, Cal Poly Aerospace strutted the right stuff as follows:

- First prize, $2,500: Mustang Aerospace for Pegasus. Amy Kronsteiner, team lead and payload module; David Caudle, propulsion system; Cory Hackett-Robles, solid model and controls; Collin Heller, configuration and aerodynamics/buoyance; Alan L’Esperance, control operations and subsystems; Jason Nguyen, structures and solid model.

- Second prize, $1,500: Central Coast Solutions for The Eclipse. Daniel Leighton, team lead, structures; Colin Burt, aerodynamics, buoyance; Mark Costa, propulsion, weights; William Howe, controls, ACLS; Hans Mayta, performance, cost; Vanessa Wood, solid modeling, configuration.

- Third prize, $1,000: Swift Lift Aerospace for SL-1

PolyHouse Adds Solar Power to Renovation

Something new has been added to the PolyHouse project – the annual undertaking by Cal Poly’s Industrial and Manufacturing Engineering Project Management class to renovate the home of a family or individual struggling with issues related to disabilities.

In May, the PolyHouse team transformed the Shandon home of 15-year-old Jacob Slattery and his parents — and they also installed a solar energy system. REC Solar donated a nine-panel system to the PolyHouse project, which will allow the Slattery family to derive much of their electric needs from the two-kilowatt, rooftop array.

Company President Kam Mofid said, “REC Solar is moved by how this innovative student project creates a community of shared purpose to help a family in need.”

Born with a severe form of spina bifida, Slattery has paralysis from mid-chest down and has been confined to a wheelchair since the age of 2. The dramatic renovations made by the PolyHouse team not only address safety and comfort issues for Slattery, but also enhance his future independence.

The 38 students who participated in the six-day makeover represent a wide variety of majors: Industrial Engineering, Engineering Management, Mechanical Engineering, Aerospace Engineering, Biomedical Engineering, Business and Agriculture.

Community support for PolyHouse continues to build. Along with the REC solar donation, an estimated $100,000 was donated in the form of cash, building materials and related assistance.

For more on PolyHouse, visit http://www.polyhouse.org/index.html.
For the third year in a row, the American Society of Civil Engineers (ASCE) honored Cal Poly with the prestigious Robert Ridgway Award given to the single most outstanding chapter out of the 280 student groups across the country. This is the fifth time that ASCE has recognized Cal Poly with this award.

The award is based on a review of the student chapter’s service and activities during the previous year. Cal Poly's 100-page annual report summarized community outreach events and professional activities completed in 2010, including the hosting of the ASCE National Concrete Canoe Competition (NCCC).

“Winning the Ridgway Award once is extraordinary – winning three times in a row is an astonishing feat,” said faculty advisor, Gregg Fiegel. “It was an amazing year. The students tackled so many events and projects and put forth a tremendous effort in everything they did. I’m very happy they were recognized with this national award.”

The 2010-2011 SCE president, Spencer Reed, said, “Our primary goal is to establish a link between the classroom and the professional organization. The Ridgway Award reflects the success of the chapter members in establishing that link.”

In addition to the Ridgway Award, Cal Poly’s ASCE chapter also received a letter of recognition for community service. Last year, the members organized two educational outreach activities that provided more than 100 local elementary and middle school students the opportunity to learn about civil engineering, concrete mix design and concrete canoes.

ASCE also recognized individual Cal Poly Civil Engineering students. Reed and winter graduate Yunling Chow received student leadership awards for serving as officers, leading special events, interacting with university administration and interacting with ASCE Sections and Branches.

Finally, Fiegel was recognized as Outstanding Faculty Advisor in ASCE Region 9. This is the third year in a row Fiegel has received this honor.

A four-year project funded by NASA has given more than 30 Cal Poly Aerospace undergraduate and graduate students an opportunity to participate in the design of future commercial planes.

“Our goal is to investigate and model technologies needed to create high-lift, fuel efficient and quiet aircraft,” said Aerospace Engineering Professor David Marshall, the principal investigator on the $4.5 million project.

According to Marshall, the project has developed an Advanced Model for Extreme Lift and Improved Aeroacoustics (known as AMELIA) using computational aerodynamic and acoustic analysis. AMELIA is now undergoing 12 weeks of testing in a wind tunnel at the NASA Ames Research Center at Moffett Field in the Bay Area.

One-eleventh the size of an actual plane, the model looks like a 100-passenger plane, but the engines have been placed on top of the wings for lower noise output. Slots in the wings also help lift the plane off the ground.

The Cal Poly research will ultimately lead to quieter aircraft, thus reducing the community noise impact of future aircraft. The new generation aircraft designed with the help of the Cal Poly data will be more fuel efficient and have the ability to take off and land on shorter runways.

While commercial production of these planes is a long way off, the research has had an immediate payoff for the students at Cal Poly.

Tina Jameson, co-director with Marshall on the project, noted, “This work has provided an opportunity for the faculty to bring the advanced concepts learned during the work back into the classroom, and it’s been an opportunity for students to get first-hand experience with new aerodynamic designs and a unique opportunity to work with one of the largest wind tunnels in the world.”

The four-year NASA grant, now in its last year, is the largest that the university has ever received for a research project.

For additional details, see: http://www.sanluisobispo.com/2011/10/10/1791408/ideas-for-plane-efficiency-taking.html#ixzz1bvMSWaxR

Above: Aerospace Engineering students Eric Paciano and Jonathan Lichtwardt work on the wind tunnel test model of the AMELIA aircraft (inset).
Last June, 10 newly-minted “masters” in stem cell research headed off to jobs and Ph.D. programs. The graduates are the first for Cal Poly’s master’s degree program established in 2009.

The graduates include Andrew Burch, Thomas Harper, Kaitlyn Kirk, Anna McCann, Christopher Miracle, Ashley Russell, Aubrey Smith, Kyla Thoele, Blake Warbington and Gabrielle Winters.

Some of their post-graduation destinations and positions include Ph.D. programs at UC Davis, the University of Washington and the University of Miami; research associate at UC San Diego; research associate at the Stanford/VA hospital; and lecturer in the Cal Poly Biomedical Engineering program.

The specialization in regenerative medicine was established by a $1.4 million Bridges to Stem Cell Research Award provided by the California Institute for Regenerative Medicine (CIRM).

The unique Cal Poly program has three main components: coursework, a research internship at a partner institution and a thesis project. Cal Poly’s stem cell research partners include Stanford, the Salk Institute, Scripps Institute, UC San Diego and Novocell, a company that manufactures insulin-producing cells for diabetics.

The graduation signifies that Cal Poly is becoming “positioned as a leading producer of sought-after graduates in the developing regenerative medicine industry,” said Trevor Cardinal, program director. “This will help to accelerate the translation of basic science discoveries into therapies for diseases such as cancer, diabetes, Alzheimer’s, Parkinson’s, spinal cord injuries, Lou Gehrig’s disease, HIV/AIDS, multiple sclerosis, Huntington’s disease, and more than 70 other diseases.”

Cal Poly’s Fire Protection Engineering Program has been awarded a $940,571 federal grant to evaluate methods for fighting wildland fires that have spread to urban areas.

The Fire Protection Engineering program is only the third graduate program of its kind in the United States, and the first on the West Coast.

“This is great news for Cal Poly’s budding Fire Protection Engineering Program. In California we face the constant threat of wildfires, and this new program at Cal Poly will help meet our demand for fire protection engineers so we can better cope with fire season and other threats. I appreciate the efforts of our students and teachers at Cal Poly for their efforts to improve fire safety in our communities,” said Rep. Lois Capps, D-Santa Barbara.

“This grant will test the effectiveness of compressed air foam systems in suppressing structural fires at wildland-urban interfaces as well as whether the systems are safe for firefighters. It will enable the researchers to perform and analyze various fire tests using both the foam technology and plain water systems, working with the Cambria and Santa Barbara fire departments and at the National Institute of Standards and Technology’s National Fire Research Laboratory in Gaithersburg, Md.

The Fire Safety and Prevention program funds local projects across the country to improve public safety. For more information, see http://capps.house.gov/media/index.shtml
Today, 1.6 billion people around the world living without electricity depend on kerosene for energy needs. Kerosene, however, not only provides poor lighting, but it comes with adverse health and environmental side-effects.

To address this global problem, Cal Poly Materials Engineering (MATE) students Mike Deagon and Rod Marstell and Professor Richard Savage partnered with One Million Lights (OML), a non-profit agency, and Lunera, a commercial company, to develop a solar-powered lantern.

Over 10 weeks this summer, Deagon and Marstell designed, fabricated and tested two lighting systems that utilize batteries and are rechargeable by a solar panel. Capable of recharging a cell phone, both prototypes also provide a higher level of illumination than currently available models.

“I really enjoyed this project because I’m interested in solar technology and the Sol lantern has such a practical application,” said Marstell.

Deagon will continue developing the prototypes this academic year with an expanded senior project team that includes Business majors. “We intend to take the prototypes to Rotary clubs,” he noted.

The entrepreneurial team is developing a business plan that will enable donations to be made to One Million Lights for fabrication of solar-powered lanterns at the Cal Poly Tech Park.

“Financial support for the Sol Project was provided by alumnus Gary Dillabough (B.S., Civil Engineering, 1987), a principal of the Westly Group, a venture capital investment firm focused on cleantech companies.”

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Tracking the movements of sharks may become a bit easier soon thanks to a project involving students and faculty from Cal Poly San Luis Obispo and CSU Long Beach.

Cal Poly Computer Science Professor Chris Clark and Marine Biology Professor Mark Moline are collaborating with CSU Long Beach Marine Biology Professor Christopher Lowe on the shark tracking project, which involves using Autonomous Underwater Vehicles (AUVs) from Cal Poly. The AUVs, which resemble torpedoes, gather and send data to scientists.

The work is being funded by a three-year, $490,000 grant from the National Science Foundation’s Robust Intelligence Program.

Until now, technology required scientists to follow sharks in small boats to track electronic signals sent from tags on the fish. The AUVs can be programmed to follow tagged sharks and then return to researchers. The underwater marine robots have the potential to allow scientists to follow sharks across longer distances and for longer time periods.

The AUVs are equipped with sensors that detect and report on the sharks’ surrounding ocean environment, providing information about factors that may influence their migration patterns.

For the project, Clark and a team of students working in Cal Poly’s Lab for Autonomous and Intelligent Robotics (LAIR) are advancing robotics technology, specifically in the areas of new estimation and control theory, Clark said.

This summer, Clark and Lowe worked with Cal Poly Computer Science students Christina Forney and Esfandiar Manii, Harvey Mudd student Chris Gage and CSULB student Mike Farris to test the AUVs and track a leopard shark off the coast of Long Beach.

The team caught a meter-long leopard shark in Sea Plane Lagoon, tagged it with an acoustic emitter and released it. They then used an AUV to track it. Following the successful test, the team is comparing the information generated using the AUV against earlier data collected by CSULB researchers who followed a leopard shark by boat.

Clark credited much of the experiment’s success to the engineering and computer programming done by Forney and Manii.

For more, see http://lair.calpoly.edu/ or http://www.csulb.edu/labs/sharklab/.
Faculty News

Dean’s Office

Fred DePiero, associate dean, was invited to give a presentation titled “How Can All This Get Done? Centralizing Efforts Across Programs” at the 2011 ABET Symposium in Indianapolis, Ind.

American Society for Engineering Education (ASEE)

Cal Poly Engineering faculty members are highly involved in engineering education research. The following publications and presentations were made at the 2011 ASEE Annual Conference and Exposition in Vancouver, B.C.

Kathy Chen (MATE), Teana Fredeen (director of E.P.I.C.), Liz Schlemer (IME) and Heather Smith (Statistics) presented “Evolving a Summer Engineering Camp through Assessment.”

Andrew Kean (ME), Brian Self (ME) and Mechanical Engineering student Paul van BloemenWaanders published “Thermodynamic Concepts in a Model Eliciting Activity.”

Saeed Niku (ME) and Mechanical Engineering student Ross Miller published “Designing Devices to Help the Disabled: Artificial Skin Tactile Sensor for Prosthetic and Robotic Applications.”

John Ridgely (ME) and Brian Self (ME) published “Using Model-Eliciting Activities in a Laboratory Course on Mechanical Instrumentation.”


Liz Schlemer (IME) and Dan Waldorf (IME) published “The Inside-out Classroom: A Win-Win Strategy for Teaching with Technology.”

Lynne Slivovsky (EE/CPE), Jim Widmann (ME), Brian Self (ME) and Kevin Taylor (Kinesiology) published “Integrating Adapted Physical Activity Projects into a Computer Engineering Capstone Class.”

Jim Widmann (ME), Brian Self (ME), Lynne Slivovsky (EE/CPE) and Kevin Taylor (Kinesiology), published “Motivating Design and Analysis Skills Acquisition through the Infusion of Adapted Physical Activity Projects in a Mechanical Engineering Curriculum.”

Multidisciplinary

Kathy Chen (MATE), Roberta Herter (School of Education), and Jon Stolk and Rob Martello of Olin College of Engineering were awarded a National Science Foundation Transforming Undergraduate Education in Science (TUES) grant to study “Collaborative Research: Understanding Students’ Development and Deployment of Lifelong Learning Skills.”

Kathy Chen (MATE), John Chen (ME) and John Oliver (EE/CPE) co-taught a wind energy activity to elementary and middle school students as part of Cal Poly’s Learn By Doing Lab Teaching Practicum.

Kathy Chen, Jennifer Jipson (Child Development) and Robert Arens (ARCH) co-taught the interdisciplinary university-wide course “Design of Museum Exhibits”
in Science, Engineering and Technology" in collaboration with community partners.

Tryg Lundquist (CE/ENVE) in collaboration with the Cal Poly Dairy Science Department received a grant from the Agricultural Research Initiative for research on anaerobic digestion. The goal of the project is to produce biogas that combusts with production of only a small amount of smog-producing nitrogen oxides.

Christopher Lupo (CSC/CPE), Paul Choboter (Math) and CSC student Jason Mak published "Numerical Ocean Modeling and Simulation with CUDA" and presented the work at the OCEANS 2011 conference in Kona, Hawaii. The conference is sponsored by the Marine Technology Society (MTS) and the Oceanic Engineering Society of the Institute of Electrical and Electronic Engineers (IEEE/OES).

Liz Schlemmer (IME) and Linda Vanasupa (MATE) received a $250,000 grant from the National Science Foundation for a project on “Creating a Replicable Transformation Path for Change: A pilot study on overcoming the barriers to individualized teaching and learning.” This is the second grant Schlemmer and Vanasupa have received to study students and faculty development within the learning initiative SUSTAIN-SLO.

Aerospace Engineering


Rob McDonald received a $900,000 NASA grant for a three-year research project on the Vehicle Systems Program (VSP), a NASA geometry tool for conceptual aircraft design. Marshall is collaborating on the project with Phoenix Integrations, a design integration software company, and JR Gloudemans, the original author of VSP.

Biomedical & General Engineering

Kristen O’Halloran Cardinal and Lily Laiho published and presented a paper at ASEE Conference in Vancouver on Cal Poly’s MEDITEC consortium program: “Evolution and Assessment of an Industry/Academic Partnership to Enable Multidisciplinary, Project-Based Learning.”

Cardinal is directing 11 new projects with Edwards Lifesciences and four with Abbott that involve students from Biomedical Engineering, Mechanical Engineering, Industrial Engineering and General Engineering. Both companies have provided $100,000 this year to support hands-on, industry-based student projects.

Cardinal is active in outreach. She facilitated a “Cal Poly Day” for 100 fifth-grade students from Santa Maria, and she hosted students from Arroyo Grande High School as part of the IDEA Honors Human Engineering course.

Trevor Cardinal presented “Arteriogenesis and Ischemia Impair Functional Vasodilation in Resistance Arteries” (FASEB J. 2011, 25, 1092.21) at the Annual Meeting of the American Physiological Society (Experimental Biology). The poster showcased senior project and thesis project research; co-authors included Joseph Zhu (Biology), Kyle Struthers (Biomedical Engineering graduate student), Thomas Kesler (Biomedical Engineering 2010) and Matthew Yocum (B.S. Biochemistry ’08, M.S. Biomedical Engineering ’09).

Cardinal was named program director for the $1.4 million Bridges to Stem Cell Research grant provided by the California Institute for Regenerative Medicine (CIRM). The funding supports Cal Poly’s master’s degree program in stem cell research.

Environmental Engineering Professor Receives National Waste Management Education Award

The Journal of Solid Waste Technology and Management presented Cal Poly Environmental Engineering Professor Samuel A. Vigil with the Iraj Zandi Award for his efforts in educating students about solid waste management.

Co-author of the widely-used textbook “Integrated Solid Waste Management: Engineering Principles and Management Issues,” Vigil received the award at the 26th Annual Conference of the American Society of Civil Engineers in Philadelphia.

The Zandi Award is given annually to someone who has significantly contributed to the field of solid waste management.

For more information on the Journal of Solid Waste Technology and Management, see: http://www2.widener.edu/~sxw0004/solid_waste.html
**Faculty News**

**Biomedical Engineering Professor Receives Patent for Splints “On the Go”**

The United States Patent Office recently issued a patent to Biomedical Engineering Professor Lanny Griffin and his co-inventor Chemistry Professor Dane Jones for a product that will aid injured soldiers in the field.

The Polymeric Splint and Rapid-Setting Polyurethane (U.S. Patent #7,901,370) is a completely self-contained, rapid-setting splinting system. The device uses advanced composite materials to create an easily applied splint that provides superior stability and flexibility in field environments by using a two-part polyurethane combined with a high-performance fiber fabric. The new splint provides an alternative for immediate treatment of broken bones in remote areas, for example during military field operations or wilderness backpacking.

**Biomedical Engineering Professor Lanny Griffin displays his rapid-setting splinting system in the Advanced Technical Lab.**

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**Robb Moss** published the following papers:

- “Linking Cyclic Stress and Cyclic Strain-Based Methods for Assessment of Cyclic Liquefaction Triggering in Sands” (co-authored by J.A. Schneider) in Geological Engineering (June 2011).

Moss presented the following papers at the American Society of Civil Engineers (ASCE) GeoRisk Conference in Atlanta, Ga.: “Teaching Reliability at the Undergraduate Level”; “Evaluating Methods for Prediction Liquefaction-Induced Settlement” (co-authored with H. Hayati); and “Bounding the Probability of Failure for Levee Systems” (co-authored with J.C. Hollenback).

At the ASCE Geofrontiers Conference in Dallas, Texas, Moss presented “Shake Table Testing of Seismic Soil-Foundation-Structure-Interaction” (co-authored with S. Kuo and V. Croasdale), and “Seismic Response of Peaty Organic Soils as a Levee Foundation Material” (co-authored with J.C. Hollenback).

Moss was elected to the editorial board for the ASCE Journal of Geotechnical and Geoenvironmental Engineering.

**Computer Science & Software Engineering**


John Clements gave a workshop talk on “Teaching First-Year Students with RSound” at RacketCon held in Boston at Northeastern University. He also led a seminar at the Google-sponsored CS4HS workshop held at Cal Poly.

David Janzen and graduate student James Reed published “Contextual Android Education” at the Conference on Software Engineering, Education, and Training held in Honolulu. At the same conference Janzen published “Supporting Introductory Test-Driven Labs with WebIDE,” co-authored with graduate students Thomas Dvornik, John Clements (CSC), and Olga Dekhtyar (Statistics).

Aided by a $15,000 grant from Google, Janzen helped initiate CSEverywhere, a workshop for high school teachers and administrators to inform and inspire area educators of grades 5-12 about the need for computing education. See http://cseverywhere.org/.

Franz Kurfess gave an invited presentation on “Partnering Enhanced-NLP with Semantic Analysis In Support of Information Extraction” at the 2011 DPO Data Summit held at the Global Reach Planning Center in southwestern Illinois. Kurfess gave a tutorial on “Computers and Knowledge,” and he led a discussion session on “Combining Ontologies and Natural Language Processing for Knowledge Retrieval” at the Semantic Technologies Conference 2011 in San Francisco.

Kurfess, John Seng and other co-authors published “Semantically-Enhanced Information Extraction” at the 2011 IEEE Aerospace Conference in Big Sky, Mont.

Chris Lupo (CSC/CPE) advised Radar for the Blind, a student project that won the 2011 Innovation Quest QL+ Award, and he was selected as the Computer Science Professor of the Year by CSC students. Lupo and Zoe Wood introduced a new course, Applied Parallel Computing, in which students use massively parallel graphics processing cards to gain significant performance improvement over traditional microprocessor software implementations. Lupo received an equipment donation from NVIDIA Corp. of 36 state-of-the-art graphics processing cards to be deployed in the computer laboratory for students to use on course projects and for research.

Zoe Wood and students published “Surface Reconstruction of Maltese Cisterns using ROV Sonar Data for Archeological Study” and “An Approach to Point-Based Approximate Color Bleeding.”
ME’s Davol Named Best Department Chair

The Cal Poly Lecturer Council presented its inaugural Best Department Chair Award to Andrew Davol of Mechanical Engineering. Davol is known for the fairness and respect he shows to all members of the university community, regardless of rank. He gives lectures access to professional development funding, summer school teaching and research opportunities. One lecturer said, “What impresses me most is that he does all this while making sure we all know that educating our students is our top concern — for everyone!”

Mechanical Engineering

Saeed Niku published “Designing Devices to Help the Disabled” at the 15th Annual Conference of the National Collegiate Innovators and Inventors Alliance (NCIIA), Washington, D.C.

Industrial & Manufacturing Engineering

Jianbiao (John) Pan and co-authors, including Patrick Hyland (M.S. MATE ’11) published “Effect of Gold Content on the Reliability of SnAgCu Solder Joints” in the Proceedings of IPC Printed Circuits Expo, APEX and the Designers Summit 2011, Las Vegas, Nev. Pan received certification as a reliability engineer from the Certification Board of American Society for Quality (ASQ). The title provides formal recognition to professionals who have demonstrated an understanding of, and a commitment to, quality techniques and practices in their job and career.


Materials Engineering

Kathy Chen involved Materials Engineering students in NanoDays outreach programs at the SLO Children’s Museum and at the Exploration Station in Grover Beach. She presented “Building the Capacity for Materials Engineering Outreach” at the Materials Research Society (MRS) Spring Meeting, San Francisco.

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Electrical Engineering


Andrew Davol (ME)

John Oliver (EE/CPE) and colleagues from UC Santa Barbara published “A Study of Re-using Smartphones to Augment Elementary School Education” in the International Journal of Handheld Computing Research (IJHCR), 2011.

Xiao-Hua (Helen) Yu served on the program committees of various international conferences, including the International Symposium on Neural Networks, the IEEE International Conference on Awareness Science and Technology, and the International Joint Conference on Neural Networks. She also published two papers titled “Modeling of a Gyro-Stabilized Helicopter Camera System Using Artificial Neural Networks” co-authored with Nicholas Layshot (B.S. EE ’03; M.S. EE ’10) and “Neural Network Based Edge Detection for Automated Medical Diagnosis” co-authored with Dingran Lu, EE graduate student, and Xiaomin Jin in the Proceedings of the IEEE International Conference on Information and Automation, June 2011.

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Richard Bergquist (Computer Science ’77) Named 2011 College of Engineering Honored Alumnus

Richard Bergquist (CSC ’77) gained renown as a visionary technologist in his position as chief technology officer of the former PeopleSoft, Inc., and his current title – chief software evangelist and board member at Locus Technologies – reflects his creative approach to the information industry.

The 1977 Computer Science graduate is also farsighted when it comes to perceiving the need to support Cal Poly.

“When I was a student, the state picked up the tab,” he said, “but Cal Poly is no longer fully funded by the state – and that means that we need to step forward and give back.”

Bergquist has consistently supported the Computer Science Department (CSC), starting with his first gift in 1986. Today, he donates yearly to both CSC and the Orfalea College of Business; a significant gift from Bergquist in 2007 also helped pave the way for the new Science & Mathematics building rising on campus.

Bergquist also serves on the CSC Industry Advisory Board (IAB), and his 15-year involvement as a volunteer strengthened his commitment to Cal Poly.

“One of our IAB tasks is to provide input about how to align the curriculum with changes in industry,” he explained. “We pointed out that students needed more practice working in teams, and the department took that advice to heart.

Now, it’s amazing to see these kids working together on multidisciplinary projects. The projects are fantastic, and the students demonstrate that they have the right stuff for industry.”

In addition to his IAB role, Bergquist has shown leadership as a distinguished member of the Cal Poly President’s Cabinet and the Cal Poly Foundation Board.

1960s

Dimitri Dimitri (EL 1962)
Dimitri Beats the Odds

Dimitri Dimitri doesn’t let anything get him down, including metastatic cancer of the gastroesophageal junction. Dimitri launched a business in Chatsworth that makes controllers for robots used in industrial automation. http://chatsworth.patch.com/articles/dimitri-dimitri-beats-the-odds

1970s

Rick Kneeshaw (ET 1970)
Disability Gave Polio Survivor Advantages

Rick Kneeshaw acquired polio at age 3 and post-polio syndrome at about 36 … At 16, he began working toward an engineering degree at California Polytechnic State University in order to become an electronics engineer. http://www2.hernandotoday.com/content/2011/aug/25/HBNEWSO1-disability-gave-polio-survivor-advantages/

1980s

Keith Carlson (IE 1984)
MarkLogic Corp. Names Keith Carlson as Vice President

MarkLogic® Corporation, the company revolutionizing the way organizations leverage unstructured information, today announced that Keith Carlson has joined the company as executive vice president of global services and alliances. http://www.sys-con.com/node/1818524

1990s

Douglas Bish (IE 1992)
Researcher Seeks to Improve Emergency Evacuations

When a hurricane or another major threat requires an emergency evacuation of a hospital, or an entire coastal community, the logistics can be a nightmare … Douglas Bish, an assistant professor in the Virginia Tech College of Engineer-

2011 College of Engineering honored alum Rick Berquist, right, was honored by Computer Science Chair Ignatios Vakalis, left, and Dean Deborah Larson.
Famed Aircraft Designer Burt Rutan (AERO ’65) Retires

Legendary alumnus Burt Rutan has created some of the most famous aircraft in aviation history. Described by Newsweek as “The man most responsible for more innovations in modern aviation than any living engineer,” Rutan, 68, announced his retirement in April.

It was 50 years ago while driving to Cal Poly for the first time that he heard about Alan Shepard’s spaceflight on the radio. The sky held no limits for Rutan, already a solo flyer and an avid model-plane builder and competitor since boyhood. The still-young space era only fueled his imagination.

“Cal Poly built on my passion and let me continue to explore and do new things. At that time, there was actually a runway on campus that would allow us to take our classroom projects and test-fly them,” Rutan recalled. He even began designing his first aircraft, the VariViggen, while he was at Cal Poly.

The hands-on experience culminated in a senior project that gave him his first claim to fame: winning the 1965 national student paper competition sponsored by the American Institute of Aeronautics and Astronautics. He graduated from Cal Poly with a bachelor’s degree in Aeronautical Engineering that same year. Unlike many in his class who gravitated toward the space program, Rutan opted to start his career as a civilian flight test engineer at Edwards Air Force Base.

“Even then, I thought I could make a bigger difference with airplanes,” he said. In particular, the experience there proved to be formative in shaping his zeal for flight stability and his “always question, never defend” approach to flight safety.

California’s Antelope Valley would become the backdrop of his prolific career over the next four decades.

“Despite what someone might expect, I cannot think of anything more exciting and fulfilling than spending more than 40 years working in the Mojave Desert,” Rutan said. “What better job could someone have than imagining an airplane shape, component or instrument that has never existed before, and then actually seeing the thing fly?

“Breakthroughs are what define our species, and the best ideas come from the collaborative efforts of small, closely-knit project teams combined with an environment that is not risk averse.”

He set his flight path as an innovator in 1974 when he founded Rutan Aircraft Factory, which specialized in experimental aircraft for amateur builders. The company’s VariEze design model, in particular, launched what has been called the “Rutan Revolution.” Its spectacular performance proved the value of a properly designed canard wing, which became a signature feature of many Rutan designs.

In 1982 he founded Scaled Composites, specializing in prototypes for aerospace and new-concept aircraft. Over the subsequent 20 years, Scaled developed more than one type of aircraft – or spacecraft – every year, in all types of sleek shapes and sizes. Among the most renowned: the Voyager, the first aircraft to circle the world nonstop, without refueling, and the suborbital SpaceShipOne, which won the $10 million Ansari X Prize in 2004 as the first privately funded manned spacecraft that, effectively, signified that spaceflight was no longer the exclusive realm of government. Then, only a couple of months ago, Rutan unveiled his final design: the Model 367 BiPod, a “roadable aircraft” that is driven like a car from the left cockpit and flown as an aircraft from the right side, running about 820 miles on a tank of gas, or 35 miles on batteries alone.

As NASA’s manned space program winds down, Rutan’s vision of a “new space age” of suborbital personal space flight and commercial space opportunities is taking wing. His work has inspired Virgin Galactic’s suborbital spaceliner, among other ventures – and he hopes such bold endeavors will inspire new generations of designers, engineers and young people to dream big.

In 1987, Rutan was awarded Cal Poly’s first honorary doctor of science degree and, in 2005, he was presented with the President’s Medal of Excellence by then-president Warren Baker. National honors he has received include the Presidential Citizen's Medal, the Charles A. Lindbergh Award and two Collier Awards, as well as being counted among the “100 Most Influential People in the World” by Time magazine and being named “Entrepreneur of the Year” by Inc. magazine.

Five of Rutan’s planes hang in the Smithsonian National Air and Space Museum. In a recent Los Angeles Times interview, Russell Lee, curator in the aeronautics division at the museum, explained what sets Rutan apart from his peers: “Aero-space engineers typically don’t like to take chances, and are more likely to improve on designs that have worked before. That’s why so many planes look the same.”

“Rutan is a true genius, not just in aerospace but in engineering,” said Dan Lineman, author of Burt Rutan’s Race to Space. “He’ll definitely go down in history as one of the best engineers of our time.”
Neifert Joins Board of Directors of Cal Poly Alumni Association

Longtime Cal Poly volunteer Kevin Neifert (B.S., Mechanical Engineering, ’84) has been named to the Cal Poly Alumni Association Board of Directors.

Currently vice president of information technology (IT) strategic initiatives and planning at Raytheon Company, Neifert has held numerous leadership positions at Raytheon, including corporate vice president for the IT integrated sourcing initiative and vice president of engineering for Raytheon’s Space and Airborne Systems business.

An active supporter of Cal Poly Engineering, Neifert has been a member of the Dean’s Advisory Council since 2006. In 2007, he was named the College of Engineering Honored Alumnus.

Gocong Signs New Contract with Browns

Chris Gocong (B.S. Biomedical Engineering ’05) has signed a three-year contract extension with the Cleveland Browns. The deal is worth $16.8 million, NFL sources reported.

The 27-year-old Gocong, who has started at outside linebacker for the Browns for two seasons after four seasons in Philadelphia, was an All-American at Cal Poly in 2005.

Cleveland’s Chris Gocong (51) pressures the Indianapolis quarterback during a game earlier this season. (Photo: Cleveland Browns)

Casparro Wins TechCrunch Hackathon for Second Straight Year

Planning a garden party? In the future, rain won’t put a damper on your event, thanks to a little plugin called Weather Checker.

The program is the brainstorm of Tony Casparro (B.S., Computer Engineering, 2005). Weather Checker was his winning entry in the TechCrunch Hackathon at the TechCrunch Disrupt conference in San Francisco last September.

Sponsored by companies such as Ford, IBM and Weather Underground, the Hackathon gives contestants 18 hours to develop a small program idea. Winners receive prizes and get exposure to potential investors. Casparro, a two-time Hackathon winner, said that the contest is a great way to meet other engineers and generate new ideas. “It spurs innovation. The purpose, ultimately, is to build awesome new companies,” he said.

Innovation and entrepreneurship come naturally to Casparro – he’s been launching companies ever since high school. He founded Formfonts (www.formfonts.com) with Fred Abler (B.S., Architecture, 1991) after graduating from Cal Poly. The site provides architects with 3D models they use in designs. WorthMonkey (www.worthmonkey.com) is Casparro’s newest venture – it helps buyers and sellers determine the value of used electronic devices.

“Even when I came to college as a freshman, I wasn’t planning to work for other companies,” Casparro noted. “Cal Poly gave me the knowledge and honed my Learn by Doing skills so that I can start my own companies and make jobs.”
In 1957, co-eds were still new to campus and slide rules ruled. Sputnik launched that year, ushering in a new era of engineering. For four aspiring engineering students from India, Cal Poly would come to represent a place and era that would change their lives forever.

This past summer Paul Gupta, Muni Aggarwal, Kamal Aggarwal (no relation) and Kailash “K.C.” Chaudhary returned, with their families, to where their journey began.

“What better place for a reunion than where we started from?” said Gupta, marveling at Cal Poly Engineering’s new generation of buildings, labs and facilities. “It’s all absolutely fantastic.”

“We’ve gathered our families together to show them how it was. That includes our children’s children – over 30 kids, a lot of them ready for college. The tour of campus has made quite an impression on them – the simulators, the helicopter model and wind tunnel. It will be remembered, and we hope some of them will go into engineering and go to school here.”

Gupta and Muni Aggarwal graduated in Electrical Engineering in 1961; Kamal Aggarwal and Chaudhary completed their studies at San Jose State University and Napa College, respectively.

Fatefully, the four men met up again in Silicon Valley. The whole silicon industry was only starting to evolve, and they had landed their first jobs with Fairchild Semiconductor, the granddaddy of the semiconductor age and the digital revolution. Fairchild went on to spawn a who’s who of high-tech companies such as Intel, AMD, National, LSI, Logic and Intersil.

From their work with Fairchild and other foundational companies, as well as their own startups and firms, all four men did “extremely well” in their engineering careers, said Muni Aggarwal.

Chaudhary’s son, Anuj, is a 1991 Electrical Engineering graduate. “My first lab was with Dr. Warren Anderson, and he remembered my father,” said Chaudhary. “It meant a lot.”

Said Gupta’s son Rajeev: “We’ve dubbed our fathers the Fab Four, and theirs is the classic immigration story. All they knew was the work ethic. Their set of experiences can’t be reproduced.

“My father says you have to have a feeling you can do something, and do what’s right. It’s a wide open world, with a lot of opportunity, and it’s up to you to grab it.”

Friends from India from left, Paul Gupta, Kailash Chaudhary, Muni Aggarwal and Kamal Aggarwal were engineering students at Cal Poly in 1957. Gupta and Muni Aggarwal are EE graduates.

Circa 1957

Circa 2011

The Gupta, Chaudhary and both Aggarwal families visited Cal Poly in June.

Custom T-shirts identified family generations.

Robert Mijares (GENE 2003)

Mijares Named Rising Star by the Visalia Times-Delta

Robert Mijares (B.S., General Engineering, 2003) received the 2010 Rising Star award from the Visalia Times-Delta, part of an annual awards program that recognizes outstanding young professionals. He is a senior associate planner with Quad Knopf, a diverse group of civil engineers, planners, biologists, land surveyors, construction specialists and landscape architects in Visalia, Calif.

Read more about Mijares in the Visalia Times-Delta

http://www.visaliatimesdelta.com/article/20110317/NEWS01/103170307

Christina Nicholson (ENVE 2008)

Christina Nicholson Joins Summit Engineering as Staff Engineer

Christina Nicholson, EIT, was hired as a staff engineer in its Water/Wastewater Division of Summit Engineering. Nicholson brings a background in winery wastewater design and enology after consulting for Bwinemaking production facilities in the Napa Valley.

http://napavalleyregister.com/business/article_c08ec1b2-7a99-11e0-9fe5-001cc-4c002e0.html

Robert Smith (ME 2006)

AeroWorx Hires New Manager of Quality Control and Engineering

AeroWorx, a leader in aerospace repair and overhaul, has hired Robert Smith as its new manager of quality control and engineering...

http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2011/08/22/prweb8738241.DTL
Parents please note: If your son or daughter is no longer at this address, please report his or her current address to the College of Engineering.