Applications in Autonomous Flight program allows engineering students to explore growing field of UAVs

It was not yet dawn when Aaron Drake and student researchers met on campus in March to review safety procedures and the detailed plan to ground test Cal Poly's RMAX helicopter, a remote-piloted, fully-autonomous flight vehicle.

Drake, a professor in the Aerospace Engineering Department, is director of the Applications in Autonomous Flight (AAF) program overseeing the student-staffed, professional flight test operation that provides research and data collection services for various applications of unmanned aerial systems (UAS). AAF team members include aerospace engineering seniors Max Heald, Eric Belfield, Brandon Barry and Nia Asmady, and mechanical engineering freshman Matthew Payne.

Cal Poly AAF got off the ground in 2013 with a $100,000 grant from the Raintree Foundation, which provided funding to hire Drake, purchase a flight test support van, and support the Earn by Doing student researchers. The strategic goal of Cal Poly’s AAF initiative is to participate in the rapid advancement in the UAS industry which is largely driven by new, small companies that may lack the expertise to examine the full system.

“Cal Poly can step into the vacuum and provide valuable services to UAS companies, while prepar
Last fall, the College of Engineering piloted participation in #GivingTuesday, the nationwide giving campaign. The 24-hour effort falls in early December following Black Friday.

“Our goals were not just about dollars raised,” noted Dean Debra Larson. “We hoped to increase philanthropic participation, especially from those who had never given before.”

Working directly with students, the College of Engineering advancement team with support from University Advancement produced videos, social media messages and email content that highlighted the importance of student clubs to Cal Poly’s Learn by Doing environment. At the end of the day, the effort paid off with a response that included alumni, parents, faculty, staff and students. Of the 193 gifts, 45 were from first-time donors. The original dollar goal of $25,000 was almost doubled with gifts totaling close to $49,000.

“We are encouraged by the results and expect to make #GivingTuesday an annual event,” said Larson. “#GivingTuesday helps make everyone more aware of the importance of philanthropy — it can open the door to the special satisfaction that comes from giving back.”

Alumni Giving Adds Up to Collaborative Lab

A new computer lab configured to optimize multidisciplinary thinking and multifaceted collaboration speaks largely to the power of small gifts.

Alumni donations helped produce a new home for collaboration among industrial and manufacturing students and their multidisciplinary counterparts. Half of the $105,000 workspace was paid with state lottery funds and half was paid by alumni donations.

“It’s a modern, highly flexible space that can accommodate a variety of collaboration activities,” said Jose Macedo, chair of the Industrial & Manufacturing Engineering Department.

Each collaboration table in the room allows up to six students to plug in their laptops, tablets or smartphones and project their screens on one of two monitors. Industrial engineering junior Jack Walsh said that he’s part of a four-member team that meets regularly in the workspace to collaborate on database management projects.

“This collaboration space has already become an intrinsic part of the department’s learning environment,” said Macedo. “And the fact that it was made possible by support from our alumni shows the impact that gifts from individuals can make on student learning.”
Parsons Gifts to Boost Cal Poly’s Innovation Quest Competition

Two recent gifts from Parsons will enhance Cal Poly’s Innovation Quest (iQ) competition, a key component of Cal Poly’s efforts to promote student entrepreneurship.

Parsons sponsored a $10,000 award in the 2015 iQ competition to recognize innovative concepts that are likely to lead to an entrepreneurial venture in the architectural, engineering and construction (AEC) arena. In addition, Parsons is providing $10,000 to aid continued presentation of the iQ program.

Now in its 12th year, the campuswide iQ competition is designed to help Cal Poly students take their Learn by Doing orientation right into the marketplace. In partnership with the Cal Poly Center for Innovation & Entrepreneurship, iQ offers no-strings-attached funding and assistance for the best ideas presented by students.

“Students enrolled in IME’s upper-division manufacturing curriculum will be heavily exposed to CNC programming and sophisticated CAD/CAM software,” said Trian Georgeou, who recently joined IME as a manufacturing engineering instructor.

CNC machining is an advanced manufacturing process that uses computers to automate and control machine tools such as lathes, mills, routers and grinders.

“In the IME Department, we have more than 80 students who are engaged in CAD/CAM programming in all its aspects,” said Georgeou. “Meanwhile, the new manufacturing concentration in the Mechanical Engineering Department brings a vast number of ME students into upper-division manufacturing courses that cover CAD, CNC machining, fixture design, automation and inspection techniques.”

Furthermore,” he said, “more than 500 students from the College of Engineering gain hands-on exposure to CNC systems and CAD/CAM software through the IME department’s manufacturing courses taught at the freshman level each year.”

Manufacturing, mechanical or industrial engineering students who have completed their freshman year are eligible to apply for the Haas scholarship. Several scholarships will be awarded each spring or summer for the following academic year, based on demonstrated interest and experience working with CNC machines and CAD/CAM software.

“This scholarship grant is another great example of the support that the Gene Haas Foundation has provided Cal Poly Engineering in expanding opportunities for our students and preparing them for today’s advanced manufacturing careers,” said Georgeou.

Haas Scholarships Fund New Directions

A $50,000 grant from the Gene Haas Foundation will support scholarships for students interested in advanced manufacturing that includes hands-on computer numerical control (CNC) and computer-aided design and manufacturing (CAD/CAM) studies.

The scholarships will provide support for students focusing on manufacturing in the Mechanical Engineering (ME) and Industrial & Manufacturing Engineering (IME) Departments.

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The Parsons award will incentivize students to not only generate innovations in architecture, engineering and construction but to also consider the market value of those ideas,” he said.

In addition to supporting Cal Poly’s iQ competition, Parsons is involved in Cal Poly’s initiative to become the leading supplier of cybersecurity professionals and has committed $100,000 to this effort over a two-year period, which began in 2014.

For more information on iQ, visit innovationquest.org.

Cal Poly iQ startups cover a wide spectrum of business.

Poly students take their Learn by Doing orientation right into the marketplace.

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Fourth-year manufacturing engineering student Ryan Blodgett (right) and instructor Trian Georgeou work at the Haas CAD/CAM machine.

Fourth-year manufacturing engineering student Ryan Blodgett (right) and instructor Trian Georgeou work at the Haas CAD/CAM machine.
Returning to Life

Kimloan Hill establishes scholarship in son’s memory

Kimloan Hill has reclaimed her life many times. She was a street vendor in Vietnam before immigrating to the U.S. In this country, she became a wife and had three sons, but domestic violence forced her to become a single mother. Realizing she wanted an education, she staged a one-person sit-in at the University of Missouri Registrar’s Office until they allowed her to enroll in the History Department on a trial basis.

“I was 41 when I received my undergraduate degree and decided to go on for a master’s degree at the University of Oregon,” said Hill. “Then I was diagnosed with cancer. My professors and fellow students were there for me, and I finally earned a Ph.D. at the age of 51.”

Despite financial hardship, all three of Hill’s sons went to college. The engineer, Jeremiah, came to Cal Poly.

“It took Jeremiah six years to complete his degree in mechanical engineering because he worked 30 hours per week or more as a mechanic all the way through,” explained Hill. “Sometimes, he just needed $50 to buy groceries.”

After graduating, Jeremiah pursued a career as an engineer in the oil industry. He was engaged to be married. But a tragic accident at home in 2011 took his life just four months after Jeremiah’s father, Benhard, died of cancer.

Several years after her son’s death, Hill attended a dean’s reception. “In being there and meeting the leadership team of the College of Engineering, I felt that I was touching my son in spirit,” said Hill. She established a lasting bond with Cal Poly and a tribute to Jeremiah by establishing the Benhard A. and Jeremiah C. Hill Scholarship Endowment with a little inheritance from Jeremiah’s life insurance policy and the money she had saved for his wedding. Doing so, she found, enabled her to return to life.

“I was finally able to get involved in a part of Jeremiah’s life,” Hill said. “The scholarship is the little bit I can do to help students in need. I know other students, like Jeremiah, might not have $50 to buy groceries at the end of the month.”

Joining Hill in contributing to the scholarship is Jeremiah’s high school friend and college roommate, Eric Gollmyer (B.S., Mechanical Engineering, 2008), who now works in the drilling industry. “I give now because I can,” said Gollmyer, simply. “I remember Jeremiah had to ask for $10 once — I hope this scholarship means that another student doesn’t have to ask for that little bit of help they need.”
Creating Sun-Powered Housing

Engineering students join Solar Cal Poly for the 2015 Solar Decathlon

It’s been 10 years since Cal Poly’s last solar home was displayed on the Capitol Mall in Washington, D.C. as part of the 2005 Solar Decathlon’s solar village.

Once again, Cal Poly has been selected to participate in the Solar Decathlon, a U.S. Department of Energy-sponsored competition. Seventeen teams of faculty and students from across the nation have been challenged to design, build and operate solar-powered houses that are cost-effective, energy-efficient and attractive. The contest culminates at the Great Park in Irvine, Calif., in October 2015.

“Cal Poly is uniquely qualified to participate in this project because of its strengths in engineering and architecture and its strong focus on project-based learning,” said College of Engineering Dean Debra Larson. “The College of Engineering is contributing a multidisciplinary team of students and four faculty advisors to work with colleagues from the Architecture Department. Team advisors include Kim Shollenberger (Mechanical Engineering), Dale Dolan (Electrical Engineering), John Clements (Computer Science) and Art MacCarley (Electrical Engineering and Bioresources and Agricultural Engineering). Sandy Stannard (Architecture) serves as the principal investigator on the project. The 100-person team includes students majoring in architectural, electrical and mechanical engineering; architecture; landscape architecture; graphic communication; marketing; and business.

At the center of Cal Poly’s Solar House is a core that contains the active intelligence of the structure — mechanical, electrical, plumbing and monitoring systems that allow inhabitants to interact with the house. The adaptable outer shell of the structure integrates sun shading, thermal mass and natural ventilation.

Solar Cal Poly hopes to raise $650,000 for all aspects of the competition, from construction materials and heavy equipment for transportation, to contractual services and published documents. The solar house will be built on campus, disassembled, trailered to Irvine, and then reassembled and lived in by students as part of the competition.

For more details on how you can help, please visit calpolysolardecathlon.org or call 805-756-7108.

Autonomous Flight

From Page 1

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Standing before the 2005 Cal Poly Solar Decathlon House at left, the 2015 Solar Cal Poly team is excited to produce a new solar-powered house like the artist’s rendering above.

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Digital Democracy

Cal Poly Computer Science professors contribute to new open government platform

The 2015 Digital Democracy platform launch will convert video files of legislative hearings into searchable transcripts, providing unparalleled public access to state government — a project initiated by Cal Poly’s Institute for Advanced Technology & Public Policy (IATPP), and aided and abetted by Computer Science Professors Foaad Khosmood, Alex Dekhtyar and Franz Kurfess.

The groundbreaking open government platform received a $1.2 million boost from the Laura and John Arnold Foundation. The funding will allow the institute to convert video files of California legislative hearings into accurate and searchable transcripts that are freely available to the public.

“This project showcases what we do best here at Cal Poly,” said Khosmood, a computer science professor who serves as an IATPP senior research fellow. “It’s an exciting Learn by Doing opportunity for students to build something special from the ground up and for a great cause. This project will provide our students with valuable experience in data science, artificial intelligence, natural language processing and machine learning, all within a multidisciplinary context.”

Digital Democracy unlocks an entirely new data source: the full text of negotiations, debates and exchanges occurring within California’s capitol. Until now, this information has not been available to the public, despite the fact that California’s 120 full-time lawmakers introduce an average of 5,000 bills each legislative session. IATPP has already beta tested a proof-of-concept version of the platform with the media and members of the public.

The Digital Democracy platform includes transcripts of legislative hearings, a searchable video database, profile pages that track campaign donations and other political information, and social media sharing functionality.

To learn more about Digital Democracy, visit bit.ly/1DQ5AuT.

Cal Poly Appoints Parsons Vice President as Visiting Director of Cybersecurity Center

In January, a top cybersecurity expert at Parsons assumed a new role. Vice President for Cyber Strategy William J. “Bill” Britton now serves as the inaugural visiting director of Cal Poly’s Cybersecurity Center, responsible for leading the university’s cyber initiative into a nationally prominent center that includes educational, research, outreach and partnering activities.

The goals of Cal Poly’s cyber initiative — which include hardware and software, facilities, and curriculum development — are to produce qualified graduates in computer science with a cybersecurity specialization and educate them in the advanced engineering, science and business applications of cyber technologies and systems. The initiative is also aimed at preparing students for service in support of the national defense industry and intelligence community, advanced study and applied research.

Dean Debra Larson stressed the timeliness of Britton’s appointment, “Both private and public sectors in the world today conduct business via the electronic highway, but we are daily confronted by news of cyberattacks that are disruptive to our economic health and security.”

She added, “With Bill’s help as the Parsons Visiting Director of the Cybersecurity Center, we will foster the talent and create the workforce to help ensure the safety of cyberspace. In fact, the active cooperation between Cal Poly and Parsons signifies a new model for university/industry relations in which we work shoulder-to-shoulder to advance educational opportunities.”

Cal Poly Rose Float Wins Leishman Trophy

Cal Poly’s “Soaring Stories” won the Lathrop K. Leishman Trophy for the most beautiful non-commercial float at the 2015 Tournament of Roses Parade in Pasadena, Calif.

The float was constructed by students from Cal Poly San Luis Obispo and their counterparts at California State Polytechnic University in Pomona. “Soaring Stories” depicted a fairytale castle and mythological griffin springing to life from the pages of storybooks.

On the San Luis Obispo campus, Cal Poly Engineering team members were at the fore, including program leader Delaney Bales, a mechanical engineering senior; design chair Jessica Brough, an aerospace engineering senior; construction chair Loren MacDonald, a mechanical engineering senior; and assistant construction chair Kendall Searing, an electrical engineering senior. The construction team included mechanical engineering students Will Dundon, Sam Fleet, Rachel Kangas, Emily Woods and Irene Yee; bioresource and agricultural engineering major Philippe Napaa; and aerospace engineering senior Morgan Montalvo. The design team included mechanical engineering senior Celine Allor and biomedical engineering senior Helena Yanez.
A Cal Poly education continues to be one of the best values among the nation’s top schools. A new survey from Payscale.com, the online salary, benefits and compensation information company, ranks Cal Poly ninth among the nation’s public universities for return on in-state tuition investment and No. 29 among all institutions, both public and private.

Cal Poly Engineering was rated 12th best value for computer science majors who can expect to earn nearly $1 million ($989,800) over 20 years — highest among all Cal Poly degree holders — on an investment of $93,200. For non-California residents, that figure is $574,600 (No. 36) at a cost of $138,400.

For other engineering majors, the 20-year return on investment is $809,800 (No. 40) and $764,600 (No. 60) for out-of-state residents.

For Cal Poly at large, graduates can expect $669,800 (up from $611,700 reported in 2014) over 20 years. The list includes the weighted total cost for a graduate based on in-state tuition rates along with the 20-year net return on investment.

The 2015 PayScale study included 1,223 public, private, religious and secular universities around the nation.

Intuitive Surgical wowed Cal Poly engineering students when the Sunnyvale, Calif., company displayed and allowed test drives of its da Vinci Xi Surgical System in the Advanced Technology Laboratory in February. At left, Amy Kerdok, Intuitive’s clinical development engineer, explains the workings of the four-armed robot. The da Vinci is designed to allow doctors to perform “minimally invasive surgery” with laser-guided precision.

Cal Poly Again Ranked High on Return on Investment

Cal Poly rated the most efficient university in the West by U.S. News

Cal Poly is rated the most efficient school among regional western universities in a U.S. News & World Report analysis that compared spending and educational quality.

U.S. News looked at the public and private colleges that scored the highest on overall undergraduate academic educational quality — as measured by their position in the magazine’s 2015 Best Colleges rankings — but that spent relatively less on their educational programs to achieve that quality.

According to the magazine, schools such as Cal Poly are doing a good job managing their financial resources relative to institutions that may have far greater resources because of more state funding, higher tuition or a larger endowment.

“This is yet another indicator of the quality and value of a Cal Poly education,” said Cal Poly President Jeffrey D. Armstrong. “This ranking shows parents, current and future students, alumni and taxpayers that we are being judicious stewards in our mission to deliver a high-quality, cost-effective education.”

The U.S. News efficiency rankings are available at bit.ly/1HupMDY.

The Mustang Way is Highly Efficient

Cal Poly rated the most efficient university in the West by U.S. News
Cal Poly Engineering Students Honored at State Capitol

Twenty Cal Poly students, including eight from the College of Engineering, who have received state and national awards were recognized on March 9 by state lawmakers at the Capitol in Sacramento.

The group was introduced on the floors of the Senate and Assembly by local representatives Assemblyman Katcho Achadjian and Senate Majority Leader Bill Monning. In addition, the students will meet with Lt. Gov. Gavin Newsom.


Participating Cal Poly Engineering students included:
- Delaney Bales (Mechanical Engineering) who contributed to the Cal Poly universities' Tournament of Roses Parade Float team, which won the Lathrop K. Leishman Trophy for the most beautiful non-commercial float at the 126th annual parade.
- Gordon Belyea (Mechanical Engineering), the team leader for Cal Poly's unmanned aerial vehicle, “Sky-Barge,” that earned honors at the 22nd annual American Society of Mechanical Engineers Student Design Competition in Montreal.
- Michelle Lam (Computer Science) received the 2014 CSU Trustees’ Award for Outstanding Achievement.
- Matthew Philley (Mechanical Engineering) and teammates Luis Cuellar and Keith Yu won the Academic Olympiad at the Society of Hispanic Engineers Conference. The trio defeated 60 other collegiate teams.
- Samantha Rawlins (Aerospace Engineering) is the first Cal Poly student inducted into NASA's Student Ambassadors Virtual Community, an online network designed to elevate the contributions of NASA interns. She joins 104 other top-performing interns across the nation.
- Kaylinn Roseman (Civil & Environmental Engineering) was president of Cal Poly’s student chapter of the Institute of Transportation Engineers, named as the institute’s international chapter of the year.
- Yakov Suvorov (Civil & Environmental Engineering) was part of a student team that placed second at the International Environmental Design Contest held at New Mexico State University.
- Courtney Thomas (Environmental Engineering) is president of the Cal Poly Society of Women Engineers, which received the Outstanding Collegiate Section Gold Award — the national Society of Women Engineers’ highest award.

For a complete list of the Cal Poly students recognized, see http://www.calpolynews.calpoly.edu/news_releases/2015/March/state_capitol.html.

When Engineering Education is Elementary

As part of National Engineers Week in February, members of Cal Poly’s Society of Women Engineers (SWE) visited local fourth grade classrooms to teach students about the field of engineering and conduct hands-on science demonstrations. At right, Berkeley Davis (Mechanical Engineering) and Melanie Thatcher (Materials Engineering) see how much weight a paper pillar constructed by a group of fourth-graders at Sinshheimer Elementary in San Luis Obispo can handle. At left, aerospace engineering student Kyle Libby shares a laugh with Davis and the young engineers. By reaching out, SWE members hope to get students interested in math, science and all things related to engineering.
SWE Honors Top Engineering Students

Cal Poly Society of Women Engineers honors five Outstanding Women in Engineering recipients for 2014

The Cal Poly Society of Women Engineers (SWE) announced five recipients of the 2014 Outstanding Women in Engineering (OWE) award at its Evening Industry banquet in January.

Attended by almost 300 students, faculty, staff and representatives from 27 companies, the banquet honored student accomplishments. In addition to the OWE honorees, 29 students were recognized with more than $32,000 in scholarship awards from Boeing, Cal Poly SWE, Chevon, Eaton, Fluor, Lam Research, Mazzetti, NetAPP, Orbital Sciences, Parker Aerospace, Phillips 66, Raytheon, Skyworks, Solar Turbines and Trane.

The OWE awardees were chosen based on four criteria: faculty recommendations, demonstrated leadership, related work experience and grade point average. The recipients are:

**Kristina Bishard**

A biomedical engineering senior from Arvada, Colo., Bishard is immersed in the world of academic research. A member of the department's skin research lab since her freshman year, she developed stand-out research. A member of the department's skin research Colb., Bishard is immersed in the world of academic average. The recipients are:

**Allie Davis**

A civil engineering senior from Boulder, Colo., Davis has a bent for international work and study. As a member of Engineers Without Borders-Cal Poly, she has been project manager for the chapter’s Thailand program since her freshman year, overseeing water sanitation, agricultural and hydroelectric projects. Another significant component of Davis’ education has included her living experiences in East Asia, Santiago, Chile and, most recently, Spain, where she is took courses at the Universitat Politecnica de Catalunya in Barcelona, a renowned engineering school. An internship in Sacramento last summer with MWH Global Inc., an international consulting firm in water infrastructure, deepened and broadened her future plans to work as a consultant for agencies, government and communities pursuing development.

**Cristina Formaini**

A computer science senior from Stevenson Ranch, Calif., Formaini credits being one of the first women to graduate from Cal Poly’s new cybersecurity program with immediately landing her a job with Apple’s product security team. Similar trailblazing traits were reflected in her role as president of the computer science department’s two largest clubs – WISH (Women Involved in Software and Hardware) and White Hat, an organization for students interested in making the Internet a safer place – where she used her leadership positions to open doors and create new learning environments for women in computing and those interested in pursuing the emerging field of cybersecurity.

**Nicole O’Hearne**

From San Francisco, Calif., O’Hearne is an architectural engineering senior with a distinguished record of academics and student leadership. She has facilitated student leadership training for Cal Poly’s nationally ranked orientation program, Week of Welcome, and is president of the Structural Engineers Association of California, where she built a range of programs to sustain, enhance and expand student connection and involvement. Following her graduation in June, she will begin a summer internship at Degenkolb, a structural engineering firm in San Francisco. The job will build on her internship experience at Holmes Culley, an international practice specializing in earthquake-resistant engineering.

**Jessica Pease**

As a woman in the world of computer science, Pease is often an anomaly, but the computer science senior from Elk Horn, Calif., aims to change that. As president of the Computer Science Department’s White Hat and WISH clubs, simultaneously, Pease organized one of the largest student groups to attend one of the world’s largest gatherings of women technologists — the Grace Hopper Conference for Women in Computing. As a club officer, Pease also started and ran a Lean-In circle to help students explore some of the issues facing women in computing. Pease’s leadership bridging the gender gap in the cybersecurity field has also been acknowledged by industry leaders.

The Cal Poly Society of Women Engineers Outstanding Women in Engineering recipients for 2014 included, left to right, Allie Davis (Civil Engineering), Nichole O’Hearne (Architectural Engineering), Jessie Pease (Computer Science), Cristina Formaini (Computer Science) and Kristina Bishard (Biomedical Engineering).
### Reaching for New Heights

**Electric commuter multicopter project aims to make quick flights a breeze**

Nine mechanical engineering seniors hope to see their electric commuter multicopter take flight, even though they’re still working on preliminary component testing and evaluation.

The project was proposed by alumnus **Bob Addis** (B.S., Mechanical Engineering, 1985) and Bill Bruner from Vertical Enterprise, in coordination with Lawrence Livermore National Laboratory and NASA. The ultimate goal is to create a small, single-seat aircraft that complies with Federal Aviation Administration regulations.

**Our main goal is to provide stakeholders with a design and the accompanying engineering analysis for a full-scale aerial vehicle capable of sustained flight,”** said team member **Alex O’Hearn.** “We believe future design iterations and improvements should continue and pave a path for the commercialization of easily accessible commuter aircraft.”

If additional funds become available, the team plans to extend its goals to include the building and testing of a full-scale prototype.

### Built for Two: The “Electric Tandemonium”

Mechanical engineering students **Austin Frederickson**, **Kris Lawrence**, **Anthony Jacques** and **Preston McElroy** are working on the Electric Tandemonium, an electric-assist tricycle designed for two people. The Tandemonium team aims to create a system that results in a “bionic feeling” for the riders in which a “lower than normal input force to the pedals would result in a greater output torque than normal.” Among the listed goals for this project are to create a final product that is safe to use and fun to ride. (Judging from the photo on Page 2, mission accomplished).

### Capstone Class Offers Solutions to Local Company

**Software Engineering Professor David Janzen** is known for his year-long senior capstone class that provides students with valuable experience working with real clients on real-world projects. One of the clients this year is **Scientific Drilling International (SDI)**, which has a research office located in Cal Poly’s Tech Park on campus.

SDI makes down-hole tools used in directional drilling for oil and other types of wells. Janzen has two student teams developing software applications that take real-time data from SDI’s tools and make it accessible on or off the rig site through mobile devices.

“Some of the significant challenges in the applications include creating real-time graphs on the mobile devices and interfacing with SDI systems,” said Janzen.

“This project involves integrating different technologies and touching every level of the software development process,” explained senior **Daniel Nishi.** “It’s great experience — I’ve been asked about it in every job interview.”

Indeed, the capstone class seems to provide an effective career launching pad — in March, the project team members had already secured jobs with companies like Workday, Intuit, Google and FabTime.
Cal Poly Engineers on Track to Compete

CAL POLY BAJA SAE CAR: Cal Poly's Society of Automotive Engineers teams design, build, assemble and test race cars to compete in the SAE Collegiate Design Series against other universities from around the world. The Cal Poly Baja SAE team, which will compete in mid-April in Auburn, Ala., includes, clockwise from left: Tony Purcaro, Kevin Jantz, Paul Schwartz, Gordan Bradaric, Michael Schier, Alex Miller, Thomas Woodward and Nick Bonafede. The collegiate Baja teams compete in four categories: Acceleration, Hill Climb, Maneuverability and Suspension Design.

CAL POLY SUPERMILEAGE VEHICLE: Mechanical engineering students Eli Rogers and Sean Michel work on Cal Poly's Supermileage vehicle in preparation for the Shell Eco-Marathon in mid-April in Detroit. The Shell Eco-Marathon challenges student teams from around the world to design, build and test ultra energy-efficient vehicles. In the past, Cal Poly teams have built vehicles that have traveled more than 1,200 miles on a gallon of gas.

CAL POLY HUMAN POWERED VEHICLE: A team of mechanical engineering students including, from left, Peter Aumann, Rama Adajian, Judy Lantaca, Loren MacDonald and Matt Allen are working on the "Sweet Phoenix" for entry in the American Society of Mechanical Engineers Human Powered Vehicle Challenge in San Jose, Calif., in late April. Designed for cornering stability rather than straight-line speed, the Sweet Phoenix is a rear-wheel drive tricycle with a light-weight carbon shell.

CAL POLY FORMULA SAE CAR: Mechanical engineering student Aaron Feinstein, above, works on the brake assembly amid a large team preparing for the SAE Formula SAE Series races in Lincoln, Neb., June 17-20.
Teamwork was on full display at the Concrete Canoe Casting Day in January as dozens of engineering students poured and hand-applied a carefully crafted mix of wet concrete into a foam mold. The result would shape their future at the Pacific Southwest Conference (PSWC) Concrete Canoe Competition.

The regional student competition of the American Society of Civil Engineers (ASCE) was held April 8-11 in Tucson, Ariz. (Results were not available as of the printing of this newsletter. See pswc2015.weebly.com for information.)

“One of our goals this year was to create a lighter and more workable mix that would be easier for the construction captains and volunteers to work with,” said Jessica Leyva, project manager. “Based on Casting Day, I’d say it was a success.”

After allowing the final canoe to cure, the team had eight weeks to sand it, smooth it, apply the graphics and seal it.

The 2015 team is made up of mix captains Joshua Core, Julie Hendrick, and Brandon McCormick; construction captains Brett Diener, Tim Forrest and Dayna Scott; and paddlers Hendrick, Diener and Forrest, with Kayla Smith.

Last year, Cal Poly’s concrete canoe took first place in oral presentation and second overall at the National Concrete Canoe Competition. It was the ninth consecutive year that Cal Poly has placed in the top five at the “America’s Cup of Civil Engineering.”

Creating a concrete canoe requires hours of hands-on effort from a large team. In January, dozens of Engineering students hand-rubbed a special mix of concrete into the canoe mold.

Sanding a Canoe

Weeks after Casting Day, the now-cured concrete is sanded for hours with increasingly fine sandpaper before sealing and painting. Here, mix captain Julie Hendrick (Civil Engineering) grinds away on the new canoe named “Jumanji.”

“Each captain has already contributed considerable time to the project — adding up to more than 1,000 person-hours so far,” said Leyva. “We’re all passionate about the project and working hard to live up to the success of past years.”
Cal Poly Engineering Students on Winning Hackathon Team

A team of six Cal Poly students, including three engineering majors, received $2,500 and four iPad tablets for their mobile mental health application as top prize winner at Cal Poly Center for Innovation and Entrepreneurship’s 2nd annual Design and Dev Hackathon. More than $7,500 in prizes were awarded at the event in January.

The winning software application, called Optimist, started with a simple idea, said Alyssa Wigan, a graphic communication major who came up with the concept.

“I wanted to create an app that would not only make stressed students feel better but to also make mental health a more common topic of conversation,” she said. “Optimist accomplishes this by making the process of finding optimism fun, using virtual geocaching to search for and unlock messages around you on a map.”

Wigan teamed up with two other graphic communication students, Hannah Giorgi and Miranda Pickett, as well as computer engineering majors Cory Mayer and Johnson Zhou, and computer science junior Jacob Johannesen.

“Hackathon is for any Cal Poly student but specifically designers and developers to spend 12 hours hacking away at any sort of idea that they have,” said Chelsea Brown, manager of Student Innovation Programs at the university’s Center for Innovation and Entrepreneurship, which co-sponsored the event with the Creative Media Development student club.

“That could be building a mobile application, it could be building a website. Essentially it’s just a fun way for students to engage in entrepreneurship for 12 hours on a Saturday.”

Hackathon attracted about 130 participants, from all of the university’s six colleges, who formed 18 teams that worked against the clock to design and develop ideas. Concepts included an app offering dating ideas and locations, a money transfer application, and a social media app to share rental housing ratings.

Optimist won the $2,000 grand prize from TransUnion, an international credit information and information management services company.

QL+ Team Designs Prosthetic Hand for U.S. Navy SEAL

The senior project challenge for mechanical engineering students Heather Martin, Jose Lemus, Ryan Burke and Michael Friedman is to design, build and test a mechanically actuated prosthetic hand for an active-duty U.S. Navy SEAL.

The project is sponsored by the Quality of Life Plus (QL+) Foundation, which partners with the College of Engineering’s QL+ Lab to develop innovative adaptive technologies on behalf of veterans with service-related injuries.

The Cal Poly seniors are seeking to design and develop a rugged and more versatile version of one of the several open-source prosthetic hands currently available. Their Navy SEAL client will operate the prosthesis by flexing his or her wrist, which creates tension in the cables routed from the forearm to the fingers, closing them into a grip. A locking mechanism will enable the user to lock the fingers in a desired grip position so that heavy objects can be carried for long periods of time.

Team member Lemus is himself a combat veteran, having served tours in Iraq and Afghanistan. “It has been an honor working on this amazing project,” he said. “As a military veteran, I appreciate what the College of Engineering and the QL+ laboratory are doing to help our wounded warriors, and I hope to see more similar senior projects in the near future.”
Game Changer

2015 Global Game Jam allows designers to test concepts and skills

Global Game Jam is a game creation event on an epic scale. In January, the annual event engaged almost 30,000 game enthusiasts at hundreds of jam sites around the world. No wonder it is recognized as the largest game jam in the world by the Guinness Book of World Records.

The 48-hour mental marathon involves fevered activity, “but it’s not a competition, it’s a collaboration,” said Foad Khosmood, Cal Poly computer science professor and president of the international nonprofit organization, Global Game Jam Inc., based in San Luis Obispo, Calif.

“The Global Game Jam brings together skill levels and talents from every field — programming, music, psychology, you name it — and creates a concentrated arena to test new ideas and learn new skills,” said Khosmood. “It’s an incubator that can inspire the kind of creative interaction that produces new products and startups.”

A case in point is MonsterCreate, an educational app that promotes creativity in children by allowing them to design their own monsters, was a new product produced at the 2015 Global Game Jam.

MonsterCreate, an educational app that promotes creativity in children by allowing them to design their own monsters

First a poet, then an engineer, Kory Barri hopes to combine his skills to innovate. The manufacturing engineering major won Cal Poly’s Al Landwehr Creative Writing Contest with his poem “Sand Castles,” which will appear in the Cal Poly literary magazine Byzantium.

“I’d say I was a poet before I was an engineer,” said Barri. He later discovered that both his passions were key to innovation. “I always dreamed of being an inventor,” he explained. “Through innovation, I can incorporate the problem-solving techniques of math and science along with the creativity of English.

“I chose manufacturing engineering at Cal Poly because the major gives students both the business and scientific sides of engineering, which with my English minor to stimulate creativity, can hopefully pave a smooth road to becoming an innovator.”

Barri says that he often discovers an abstract metaphor hidden between engineering and language arts, as in “Sand Castles,” which uses the structure of a sand castle as a metaphor for human consciousness.

“Writing and engineering are two distinct, yet equally important pieces of what makes me who I am,” he said. “It’s quite a humbling thing when the two collide into a single idea.”

As man wages war against waves on the shore
With a pretense to win, he within prepares for
That swift, shameless fall; what else could be planned?
A structure of sand is not structured to stand.

From “Sand Castles”

FOR INFORMATION
on.fb.me/1HTaZ5L

Related link: MonsterCreate

Get Featured!!

Working on a cool senior project? Do you want your work to be seen by prospective employers, friends, family, and other students?

YOUR PROJECT COULD BE SHOWCASED ON THE COLLEGE OF ENGINEERING’S FACEBOOK PAGE

HOW IT WORKS
• Every Thursday the College of Engineering Facebook page will feature a student project.
• All current Cal Poly College of Engineering students are invited to apply.
Visiting Researcher Brings International Focus to Cal Poly CubeSat Program

CubeSats, which have shown how lots of little satellites can do a lot of space science, are about to be further enabled by a similar approach — a little closer to Earth.

The goal of the SatNet program is to harness the collective power of individual ground stations to receive CubeSat data. One of SatNet’s developers, Ricardo Tubio, arrived at Cal Poly last fall as a visiting post-doctoral researcher from the University of Vigo in Spain.

During his year at Cal Poly, funded by the European Barrie Foundation to promote international technology development, he is coordinating an international SatNet team, including two Brazilian students who will join him at Cal Poly this summer.

“Currently, no operational network exists for CubeSats,” said Tubio. “Our project, which is expected to be ready by September, will connect many different ground stations together by Internet. Someone in Europe, for example, will be able to use a ground station in North America to communicate with a satellite.”

The international, open-source project is largely funded by the European Space Agency.

“I had heard about Cal Poly because of its role in developing the CubeSat design standards,” said Tubio. “I met Jordi Puig-Suari (founder of the Cal Poly CubeSat Program) in Spain when we were both working on projects for the European Space Agency, and through our shared work and interests, we established solid bonds.”

“One of the goals of SatNet is to establish multi-national collaborations that broaden the small satellite developer community and enhance the sharing of knowledge,” he said. “I think we’ll see how diversity can bring exciting new ideas and opportunities to the space industry.”

Transportation is Going Places at Cal Poly

In Anaheim, 10,000 passengers can board up to 10 different transportation modes daily. Los Angeles’ Union Station now accommodates foot, bicycle and bus traffic, while California just broke ground on a bullet train. That’s a glimpse of the changing transportation landscape that awaits a new generation of transportation engineers — and Cal Poly’s transportation program is reflecting this future with new faculty, curriculum and applied research opportunities.

Leading many of these changes are Anurag Pande and Robert Bertini in the Civil & Environmental Engineering Department. New to Cal Poly, Bertini brings experience as current chair of the operations section and traffic flow committee of the Transportation Research Board. He also served as deputy administrator of research and innovative technology for the U.S. Department of Transportation.

“When I talk about transportation, I talk about challenges that inspire us to get involved in solving problems — safety, mobility, sustainability,” said Bertini. “I try to connect students with the profession through community-based projects using real data, interactions with professionals, and by pursuing scholarships, internships and other opportunities.”

The hub of these goals is a new transportation engineering student workspace that will be administered by the student chapter of the Institute of Transportation Engineers. Using a data-driven approach, students will help industry and government agencies find answers and explore opportunities in the areas of sustainable transportation, intelligent systems and safety.

Another program goal, said Bertini, “is to prepare our students to get out in the world and get involved in modernizing the way we solve transportation problems.”

“I try to connect students with the profession through community-based projects using real data, interactions with professionals, and by pursuing scholarships, internships and other opportunities.”

Robert Bertini | Civil & Environmental Engineering

Transportation systems planning students accompany Rob Bertini, associate professor, for a spin around Engineering Plaza. From left to right: Brian Rodriguez (City & Regional Planning), Nora Chin (Transportation Engineering) Alex Chambers (Civil Engineering), Professor Robert Bertini, Sam Gross (Transportation Engineering), Lance Knox (Transportation Engineering) and Johanna Caspersson, exchange student from Sweden.
CPE
Project Showcase

Computer Engineering students display a wide spectrum of capstone senior projects

Fun with science: Requiring both hardware and software expertise, the PORUS ASTRO SUPERCOMPUTER team worked with Sandia National Labs to build a “Jetson-based” low-cost, high-performance supercomputer. At right, computer engineering student Nate Wrye demonstrated the features of the computer that included a Jello mold of a human brain on top, along with the requisite number of wires. Along with Wrye, the Porus Computing team included Will Blumhardt, Cary Dobec, Zach Reardon, Sean Sheen and Eric Sobel.

Above: Establishing a RADIO FREQUENCY IDENTIFICATION LIBRARY for use with mobile devices is the subject of a team working with Professor Tali Freed, left, that includes Vincent Chan, Darren Mistica, Katrina Cruz, Jeslin James and Daniel Shu. Right: The RADIO FREQUENCY PHOTOGRAPHY project aims to “tag” a person into a photo by using RFID scans. Team members included Anthony Fata, Anibal Hernandez and Robert Prosser.

Below: BICYCLE ENERGY HARVESTING using two sources of power — solar cells and electric sensors mounted near the spokes — was the subject of a project by Jackie Fong, Anna Velasquez, Aaron Gragg and Steven Jack.

The NO ARMS LASER TAG team is designing laser tag hardware that can be mounted on a person’s chest or wheelchair so that they can play laser tag. The team includes Paul Fallon, James Johnston, Zach Mintzer and Michael Norris.

Cal Poly CubeSat Rides on Vandenberg Launch that Carries Climate Satellite

A United Launch Alliance Delta II rocket carrying the Soil Moisture Active Passive (SMAP) payload for NASA and a CubeSat for Cal Poly lifted off from Vandenberg Air Force Base in late January.

SMAP’s purpose is to map the moisture levels in topsoil around the world to help scientists better predict droughts, floods and other weather factors. The spacecraft ascended into space and deployed its solar arrays after a flawless launch, stated NASA officials. The three-year, $916-million mission is managed by NASA’s Jet Propulsion Laboratory (JPL).

SMAP has a giant antenna that will help create a global map of topsoil moisture levels every three days. The antenna, which is close to 20 feet in diameter, is the largest of its kind ever flown in space, according to NASA, and is unbelievably accurate.

In addition to the SMAP, the rocket also carried three nanosatellites, also known as CubeSats, for Cal Poly, JPL and Montana State University.
Pat Howe (Journalism) and Foaad Khosmood (Computer Science) received a grant from CPConnect to launch an online video game review and analysis magazine, Poly Game Review. Students in majors from across campus will produce the publication.

Biomedical Engineering

Kristen Cardinal and biomedical engineering students Scott Herting and Alex DiBartolomeo attended the annual conference of the Surfaces in Biomaterials Foundation, Biointerface, held in Redwood City, Calif., where they presented their work on “Human Umbilical versus Coronary Cell Sources for Tissue Engineered Blood Vessel Mimics.”

Civil & Environmental Engineering

Robert Bertini participated in a panel discussion on “Redefining Mobility: Connected and Automated Vehicles” at the San Diego Association of Governments Board of Directors retreat in San Diego. The session was chaired by alumnus Randy Iwasaki (B.S., Civil Engineering, 1982), executive director of the Contra Costa Transportation Authority.

Yarrow Nelson received a $46,000 grant from BiOwiSH Technologies Inc. to investigate methods to remediate petroleum-contaminated soil in Kuwait. The company develops and manufactures environmental products for consumer, wastewater treatment, agriculture, aquaculture, and agronomy industries. Graduate student Brad Kohlrus and undergraduates Sam Cronnin and Dominic D’Orazio have contributed to the on-campus research that involves simulating soils and petroleum contamination, measuring

College of Engineering Announces 2014 Faculty and Staff Awards

Cal Poly’s College of Engineering announced recipients of industry and donor-sponsored faculty awards, an endowed professorship and the 2014 Outstanding Staff Awards at the college’s winter meeting in December.

Electrical Engineering Associate Professor Dale Dolan received the two-year, $20,000 Lockheed Martin Endowed Professorship. Dolan works in the area of power and energy, focusing on energy efficiency, sustainable energy and power electronics, all of which directly serve the aerospace industry. His partnerships with industry included work with Airbus Defense and Space, Inc. on the “MEA (More Electric Aircraft) Failure Simulation” project. He also received support from Lockheed Martin for his work with the Cal Poly Sustainable Power for Electrical Resources project and from Northrop Grumman for work on cold capable electronics.

Mechanical Engineering Professor Russ Westphal was awarded the $1,000 Raytheon Excellence in Teaching and Applied Research Award. Westphal received grants from the U.S. Air Force, Northrop Grumman and NASA for a wing boundary layer data measurement system.

The Don & Paula Heye Award for Outstanding Club Advisor was presented to John Fabijanic, lecturer in the Mechanical Engineering Department. Fabijanic serves as mentor to three Society of Automotive Engineers (SAE) student design competition teams, including Formula SAE, Formula Electric and SAE Mini Baja.

The Don & Paula Heye Award for Outstanding Teaching was presented to Vladimir Prodanov, assistant professor in the Electrical Engineering Department. Prodanov’s recognition is tied to his classroom teaching initiatives, such as video recordings, redesign of connected lab experiences and the senior project lab.

Donna Aiken, administrative support coordinator in Computer Engineering, and Cody Thompson, technical support staff in Aerospace Engineering, received this year’s Outstanding Staff Awards.

As the sole support staff for the Computer Engineering program, Aiken has a wide range of responsibilities, such as developing logistics for the CPE mentor program, editing the CPE alumni newsletters, tracking the program budget, supervising student assistants, overseeing makeover of the program website and handling all other office management tasks.

Thompson, the only technician for Aerospace Engineering Department, is recognized as a multi-tasking problem solver with infinite patience for last-minute requests.
Sam Vigil Recognized for Lifetime Achievements in Waste Management

Sam Vigil, a member of Cal Poly’s Civil & Environmental Engineering Department since 1982, was awarded the Richard I. Stessel Waste Management Award by the Air and Waste Management Association. The award recognizes individuals or agencies for outstanding achievements in waste management science and technology, management and regulation, or education.

Vigil shares this year’s award with Ryan Dupont of Utah State University. The presentation ceremony will take place June 24 at the Association’s 108th Annual Conference & Exhibition in Raleigh, N.C.

Vigil’s career includes 29 years of active and reserve military service, during which he improved the U.S. Navy’s waste management and environmental stewardship practices. One of his key professional accomplishments was development of an early computer model for solid waste management, which was first used by the California Integrated Waste Management Board.

Vigil is also known as a leader in the application of waste management techniques to the emerging field of sustainability engineering. At Cal Poly, he developed a unique graduate course in sustainable engineering and served as a member of two interdisciplinary teams working to develop sustainable buildings and facilities on campus.

Vigil also published “Integrated Solid Waste Management: Engineering Principles and Management Issues” with co-authors George Tchobanoglous and Hilary Theisen (McGraw Hill, 1993).

Computer Engineering & Computer Science

Foaad Khosmoood, Phil Nico and computer science graduate student Jon Woolery co-authored “User Identification Through Command History Analysis,” which Woolery presented at the 2014 IEEE Symposium Series on Computational Intelligence in Orlando, Fla.

Khosmoood also helped produce another record-breaking Global Game Jam. In January, the annual 48-hour game creation activity attracted almost 30,000 participants from 78 countries. Khosmoood serves as the president of the San Luis Obispo-based non-profit corporation. The Cal Poly local jam site was organized by the Cal Poly Game Development club and sponsored by iFixit corporation. For information see globalgamejam.org/2015/jam-sites/cal-poly-ifixit.

Chris Lupo facilitated an equipment award of 15 high-performance workstations with Xeon Phi coprocessors from Intel Corporation to promote teaching and research in massively parallel accelerated computing.

Computer Science & Software Engineering

John Clements gave an invited talk at RacketCon, a workshop focused on the Racket programming language, held this year in St. Louis. Clements also served as program chair of the Scheme and Functional Programming Workshop in Washington, D.C.

Aaron Keen and Kurt Mammen published “Program Decomposition and Complexity in CS1,” at the ACM Special Interest Group on Computer Science Education (SIGCSE) 2015 conference in Kansas City, Mo.

Keen and Zoë Wood also published...
Touring the General Motors plant in China with Cal Poly Industrial Engineering’s Karen Bangs, right, were Nick Kelly, Cal Poly industrial engineering senior; Patty Guerrero from the University of Nevada, Reno; Justin Geyer (back), from CSU Chico; Chris Renwick from Deakin University; Jeff DeBord (back), University of Cincinnati; Sean Macwilliams, Cal Poly industrial engineering junior; Carl Thompson (back), CSU Chico; Connor Owen, Cal Poly business senior; and Jessica Wang, resident director assistant for the University Study Abroad Consortium.

This year, Google provided grants to 53 computer science faculty and instructors from colleges and universities in 24 U.S. states. Cal Poly was singled out to receive four awards to computer science professors John Clements, Michael Haungs, Zachary Peterson and Zoë Wood.

The unrestricted gifts of $5,000 will be used to identify and implement solutions for increasing student engagement and retention, including development of activities, projects and labs.

These high-quality instructional materials will be added to the open source EngageCSEdu database created by Google in partnership with the National Center for Women in Information Technology.

Dan Jansen, chair of the Civil & Environmental Engineering Department, has been elected a Fellow of the American Concrete Institute (ACI). As an ACI Fellow, Jansen represents “outstanding contributions to the production or use of concrete materials, products and structures in the areas of education, research, development, design, construction or management.”

Jansen was recognized for his research in areas that advance the knowledge base of the concrete structures industry. His work with compacted earth was also cited for contributing to the construction of safe concrete structures in seismically active developing countries. An active proponent of student research and industry engagement, he has encouraged student study of recycled materials in concrete and the use of concrete as a low-impact building materials.

Jansen earned a bachelor’s degree in structural engineering from UC San Diego and a doctorate in civil engineering from Northwestern University.
Matching” with UC Santa Barbara co-authors at the Photonics West Conference San Francisco. The research is on combining photonics functionality and electronics functionality on a single silicon chip.

**Industrial & Manufacturing Engineering**

Tali Freed chaired a session on “Community Service Operations Research: Learn by Doing” at the INFORMS Conference in San Francisco. Papers presented in the session were authored by alumnus Jesse Buehnenberger (B.S./M.S., Industrial Engineering, 2014); industrial engineering undergraduates and graduate students Jessica Burke, Colyn Dickson, Liang Li, Lauryl Nakagawa, Heidi Richardson and Andrea Schmidt; aerospace engineering graduate student Blake Currie; and engineering graduate student Roopak Mitra.

**Materials Engineering**

Kathy Chen, chair, was invited to give the keynote speech at Super STEM Saturday, Teacher Leadership Capacity Collaborative for 3rd-5th grade teachers. She spoke about “Engineering Pathways to Engineering.”

Chen is working with Cal Poly’s Center for Excellence in STEM Education to teach a course on “Mentors in Out of School Time” to infuse engineering into the Bright Futures after school programs.

**Mechanical Engineering**

Mason Medizade served on the technical committee of the Society of Petroleum Engineers Western Regional Meeting held in Anaheim, Calif., where he also chaired two sessions on Fracturing Technologies and Facilities and Water Management. Medizade also co-authored “Analysis of Five Different Cyclic Steam Stimulation Projects in California’s Opal-A Diatomite” presented at the conference.

Medizade helped facilitate a donation from Bryan Research & Engineering of a 50-seat license for its Promax process simulation software. Used worldwide to design aspects of fluid processing plant design and air emissions studies, the technology enables new curriculum development and helps prepare Cal Poly mechanical engineering and environmental engineering students for professional careers.

**Steffen Peuker**, James L. Bartlett, Jr. Endowed Professor, and instructor Jennifer Mott were awarded the Service Learning Faculty Fellows award. Sponsored by the Center for Community Engagement and the Center for Teaching, Learning, and Technology, the awards recognize Peuker and Mott for their incorporation of service learning outreach into the mechanical engineering freshmen activity course. Freshmen students design hands-on demonstrations of engineering principles and present them to grade school students from underserved local schools to promote interest in STEM education.


Noori presented a poster on “Damage Detection of Plate-Like Structures Using Computational Intelligence Concepts” at a conference on Structural Health Monitoring and Inspection of Advanced Materials, Aerospace, and Civil Infrastructure X, part of SPIE Smart Structures/NDE 2015 held in San Diego. He participated in the Distinguished Seminar in Structural Engineering at UCLA, where he discussed “Overview of Structural Health Monitoring and Some Recent Work in Emerging Areas.”

Noori serves as a member of ASEE’s Executive Working Group on Engineering Access and Affordability.

**Brian Self** and **James Widmann** presented and published “WIP: Learning Fundamental Mechanics Relationships Using Inquiry Based Learning Activities” at the Frontiers in Education Conference in Madrid. At the same conference, Self, Widmann and Michael Prince from Bucknell University led a mini-workshop on “Inquiry-Based Learning Activities: Hands-on Activities to Improve Conceptual Understanding.”

Self and Widmann also presented a workshop on “Active Learning and Inquiry Based Learning Activities in Dynamics” at the University of Navarra – Tecnun in San Sebastian, Spain.


Westphal served as faculty advisor to the SkyBarge student team. The unmanned aerial vehicle placed second in American Society of Mechanical Engineers Student Design Competition on Nov. 17 in Montreal.

Press on the SkyBarge team included the following:

- Cal Poly News — calpolynews.calpoly.edu/news_releases/2014/November/second_drone.html
- The Tribune News — calpolynews.calpoly.edu/news_releases/2014/November/second_drone.html

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**CENG Welcomes New Faculty**

**Graham Doig**
Associate Professor, Aerospace Engineering
Ph.D., University of New South Wales, Sydney, Australia
Research & Expertise: Experimental and numerical aerodynamics, prototype vehicle design and development and interdisciplinary research in fluid dynamics.

Since arriving on campus, Doig has overseen a major overhaul of the wind tunnel laboratory and founded the Fluids Laboratory for Interdisciplinary Projects (FLIP), a non-traditional research group that focuses on cutting-edge projects, such as mimicking nature’s most capable long-range travelers to create more efficient air, road and marine vehicles; using explosive blast waves to extinguish large-scale fires; and designing a UAV that can collect fresh volcanic lava samples to better predict eruptions. “There are no dull days at FLIP,” he noted. “In fact, I want to better showcase the unique nature of engineering education at Cal Poly.”

**Davide Falessi**
Associate Professor, Computer Science/Software Engineering
Ph.D., University of Rome Tor Vergata
Research & Expertise: Software engineering, empirical software engineering, requirements engineering, software architecture and technical debt.

Currently the multimedia editor of IEEE Software, Falessi is conducting research on technical debt, which refers to the eventual consequences of poor system design. He is also developing the software infrastructure for the Digital Democracy project. “I’m really excited to teach software engineering principles and its practical aspects in a Learn by Doing way,” he said. “In my experience, this is the only way students can effectively learn the discipline.”

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**Davide Falessi**
Computer Science & Software Engineering
The Cal Poly Industrial and Manufacturing Engineering class of 1964 reunited in San Luis Obispo in October to celebrate its 50th reunion. The classmates included, left to right: Don Hilmer, Steve Ford, Bob Young, Jon Monett, Gene Borg, Burt Adams, Larry Meyer, Joe Morgan, Del Chesebro, Dave Hansen, Bob Martin, Don Jaques and Worth Holmes.

### 2000s

**Gurpal Bhoot**
(B.S., Electrical Engineering, 2012)

**Alumni’s Smart Thermometer Connects to your iPhone**
California-based Swaive, founded by Cal Poly alumnus Gurpal Bhoot, aims to launch its infrared ear thermometer during the first quarter of 2015. The device connects to iPhones via Bluetooth to help users track whether a fever is trending up or down.

[bit.ly/1FU2UJJ](bit.ly/1FU2UJJ)

**Aaron Rivera and Mark Paddon**
(B.S., Computer Science, 2012)

**Alumni’s App is Top Tour Guide Sidekick**
After a graduation trip to Machu Picchu, Aaron Rivera, Mark Paddon and some friends decided to develop an application that would serve as a tour guide sidekick. Their app, Guidekick, is a travel guide, an audiobook and a tour guide wrapped into one cell phone-sized package that users can keep in their pockets.

[bit.ly/1rUJmh9](bit.ly/1rUJmh9)

**Jason L. Anderson**
(B.S./M.S., Computer Science, 2010)

**Cloud Architect at IBM Cloud Labs**
Jason Anderson, a cloud architect for IBM Cloud Labs, was a presenter at the 2014 Cloud Expo on technologies including Cloud Foundry and OpenStack. His previous roles at the company have included product development and solution enablement.

[bit.ly/1yRyPKd](bit.ly/1yRyPKd)

### 1990s

**Wade Horton**
(B.S., Environmental Engineering, 1998)

**Public Works Director for San Luis Obispo County**
Last fall, Wade Horton was hired by the County of San Luis Obispo as its new public works director. Formerly deputy director of the utilities department for the City of San Luis Obispo, Horton is now responsible for overseeing the operations of the county’s public works department, which has approximately 190 full-time employees.

[bit.ly/1Epcd4y](bit.ly/1Epcd4y)  [bit.ly/1tQojkc](bit.ly/1tQojkc)

**Rosemarie Gaglione**
(B.S., Environmental Engineering, 1997)

**Director of Public Works for City of Goleta**
Rosemarie Gaglione was named city public works director in Goleta, Calif., after serving as the interim director. She has worked for the city since 2007 as senior project manager and was named capital improvement program manager in July 2008.

[bit.ly/10F5rZB](bit.ly/10F5rZB)

**Kennan Beard**
(B.S., Metallurgical & Materials Engineering, 1990)

**CEO Knows How to Run a Railway**
Kennan Beard was named CEO of the Sierra Northern Railway. He has more than 20 years of experience in railroad operations, most recently as the chief operating officer of the Modesto & Empire Traction Co. and the Beard Land Improvement Co. in Modesto. A fifth-generation railroader, Beard’s experience includes track design and construction, locomotive design and operation, and intermodal operations.

[bit.ly/143bSqT](bit.ly/143bSqT)

**Clement Huang**
(B.S., Computer Science, 1997)

**Chief Product Officer for China’s Leading Mobile Ad Platform**
China’s leading mobile ad platform company, Madhouse, appointed Clement Huang chief product officer. Huang moved from Yahoo USA, where he was responsible for building and managing the product team to create Yahoo’s new Programmatic Buying Platform.

[prn.to/1KmJAsD](prn.to/1KmJAsD)

**Alex Go**
(B.S., Electrical Engineering, 1991)

**Freed Associates Names New Client Executive**
Freed Associates, a California-based healthcare consultancy, appointed Alex Go as client executive. Prior to his position with Freed, Go served as founder and CEO at Livewell Health, a technology-enabled services provider that
Alumni News

Alumnus and Former Professor Honored for International Cooperation

The American Institute of Aeronautics and Astronautics (AIAA) presented the 2015 International Cooperation Award to Cal Poly alumnus Russell Cummings and Andrea Schuette, a research engineer at the German Aerospace Center. The award recognizes leadership of multiple international teams investigating stability of air and sea vehicles using computational simulation. The award will be presented at the AIAA Gala Awards ceremony in Washington D.C. in May.


For their work, the largest NATO research program of its kind, Cummings and Schuette led a multinational team of 46 researchers from 14 NATO member states. The group produced a data set, based on computational fluid dynamics, which is especially critical to understanding aircraft moving at different speeds through the air and ships encountering unpredictable sea dynamics.

Cummings and Schuette also received the 2012 NATO Research & Technology Organisation Scientific Achievement Award, which is the highest award that NATO gives for group research. Additionally, Cummings was awarded the 2009 Frank J. Seiler Research Award from the U.S. Air Force Academy; an AIAA 2004 Sustained Service Award; the 2002 U.S. Air Force Science and Engineering Award; and the 1994 AIAA National Faculty Advisor Award.

assists seniors with living independently at home and families seeking assistance for senior care.

1980s

Daniel McIntyre
(B.S., Civil Engineering, 1989)

New District Engineering Service Manager

Daniel McIntyre, public works director for the City of Livermore, joined the Dublin San Ramon Services District as engineering services manager in February. McIntyre has been with the City of Livermore for almost all of his 25-year career. He joined the city’s engineering division in 1990 and became city engineer in 2000.

Keay T. Nakae
(B.S., Electronic Engineering, 1989)

New Senior Healthcare Analyst at Chardan Capital Markets

Keay Nakae joined Chardan Capital as senior healthcare research analyst. He has more than 15 years of experience as a sell-side research analyst covering healthcare companies and previously worked at Ascendiant Capital Markets.

Leonard Pieroni
(B.S., Mechanical Engineering, 1986)

Elected to City Council of La Cañada Flintridge

Leonard Pieroni was elected to a seat on the La Cañada Flintridge City Council in March. Pieroni is project manager at WorleyParsons, an international engineering firm with offices in Monrovia, Calif.

Cindi Christenson
(B.S., Mechanical Engineering, 1982)

First Female Registrar of California’s Contractors State License Board

The new registrar of contractors in California has the distinction of being the first female appointed by the Contractors State License Board (CSLB) in its 85-year history. Cindi Christenson assumed her new duties on Jan. 1. A lawyer and mechanical engineer,

Exploring Space at Scale

Alums work on models of James Webb Space Telescope

A team of Cal Poly aerospace engineers has helped create a new model of space exploration. Their 1/6-scale model of the giant James Webb Space Telescope (JWST) went on a national tour to introduce the public to a space mission that is intended to provide a first look at what happened right after the Big Bang.

In 2018, NASA plans to launch the JWST to succeed the Hubble Space Telescope, which has been in orbit since 1990. It is a particularly ambitious engineering project because the 21-foot primary mirror and sunshield are folded to fit into a tiny capsule at the top of a rocket and then unfurl — in a meticulously arranged sequence of actions — in space.

“The James Webb has 30 such actions — called deployments,” said Colin Burt (B.S./M.S., Aerospace Engineering, 2013). “When fully deployed in space, the sunshield will be the size of a tennis court, or half the size of a 727 passenger jet.”

“Up until we designed this model, there wasn’t anything to help the public understand the complexity of the deployments,” said Chas Carlson (B.S., Aerospace Engineering, 2013). But in 2010, then-students Burt, Carlson, Paul Innes (B.S., Aerospace Engineering, 2012), Mark Costa (B.S., Aerospace Engineering, 2011) and Adam Chase (B.S./M.S., Aerospace Engineering, 2014), were tapped as interns to design and build a 1/6-scale model of the James Webb as a public outreach tool.

Since 2012, when the project was completed at Cal Poly’s Tech Park, the replica has wowed enthusiastic crowds at space centers and visitor centers across the country. During a typical 20-minute public demonstration, the audience sees the solar array unfold behind the telescope, the sunshield open up, and the 18-segment mirror come together to form one complete mirror.

Following their JWST model project, professional opportunities for the Cal Poly graduates have also expanded. The startup they worked for, Exploration Systems, merged with Genesis Engineering Solutions, a space and technology company based in Maryland.

“Exploration Systems had a knowledge base and capabilities that Genesis didn’t, and vice versa,” said Carlson. “The merger’s given us a lot more tools in the toolbox.”

In addition to original team members Burt, Carlson and Innes, their current team includes Reed Danis (B.S., Aerospace Engineering, 2012). Burt and Carlson’s model work has also led to another big opportunity: both alumni are contracted by NASA for systems engineering and integration testing on the actual James Webb flight project at Northrop Grumman Space Park in Redondo Beach, Calif.
Two Brothers,
Two Successes

Ted and Dick Melsheimer take a family code of ethics to heart: work hard, give back.

The brothers, both Cal Poly mechanical engineering alumni, have worked hard to build family businesses, and both have established long habits of generous support for the College of Engineering.

Ted (B.S., Mechanical Engineering, 1959) is president of Mustang Manufacturing, the Carson City, Nev., business he founded that makes squeeze valves for natural gas pipelines. Three generations of his family are now involved in the business, including his wife Sharon, daughter Susan, son Steve (B.S., Engineering Technology, 1992) and granddaughter Lyndsey.

Dick (B.S., Mechanical Engineering, 1961) is president of Melfred Borzall, the company his father, Fred Melsheimer, started in 1946 as Melfred Welding.

Through Ted and Dick’s focus on the people and the overall environment of their respective organizations, they have created model company cultures — in addition to building the top manufacturing companies in their fields.

Ted’s path to success began in 1967 when he began work with DuPont to develop a tool that would control the flow of gas through a pipe made of a revolutionary new material called polyethylene. He built a business that still leads the power-driven hand tools industry as the only company whose sole focus is squeeze tools. By concentrating all its resources on squeezing pipe, Mustang Manufacturing has gained the reputation of making the most efficient pipes in the industry.

Melfred Borzall, which will mark its 70th anniversary next year, is one of the leading manufacturers of horizontal directional drilling (HDD) tools and supplies.

Dick was recently honored as a Legend of HDD for 50 years of innovations that have improved the tools and technologies used to install underground utilities. The award was presented by the North American Society for Trenchless Technology in recognition of Dick’s work on hydraulic drilling equipment for installing underground utilities, the electronic drill bit locator, the electric strike alarm for HDD, and the use of electric-over-hydraulic control valves.

Melfred Borzall, known for its red tools, also aims to be as green as possible. The company’s long-term commitment to protecting the environment is reflected in the 64,000 square-foot, state-of-the-art manufacturing plant in Santa Maria, Calif. The facility includes a photovoltaic system of almost 1,000 solar panels that produces enough power to supply about 90 percent of the plant’s electricity.

The company is also recognized as a good place to work. During the recent recession, Melfred Borzall avoided employee layoffs through a furlough program and continued to move ahead with much-needed expansion. As a result, when the economy improved, employees were able to return to full-time schedules with a company poised and ready to compete in new and expanding markets.

“Our father’s education stopped at the ninth grade,” said Ted, “but he was a wonderful mechanic; an innovative engineer. He always stressed the work ethic: ‘Do what you do well and get an education you can use!’ I think it made Pop proud to have Dick and me at Cal Poly. Of course, the education we received directly applied to our careers.”

Randy Iwasaki (B.S., Civil Engineering, 1982)

New Chair of National Freight Advisory Committee

The U.S. Department of Transportation appointed Randy Iwasaki as executive director of the Contra Costa Transportation Authority. He will also serve as the chair of the National Freight Advisory Committee.

Richard C. Holzer (B.S., Environmental Engineering - HVAC, 1980)

New Managing Principal Engineer at Southland Industries

Southland Industries, one of the nation’s largest mechanical, engineering and plumbing building system companies, welcomed Richard Holzer as the managing principal engineer of its Southern California division. He will provide leadership for the division’s design engineering, building information modeling and constructability departments, and offer strategic guidance for Southland’s growing engineering services at regional and national levels.

Wolfgang Struss (B.S., Electronic Engineering, 1980)

Interim President and CEO of MicroPlanet

Wolfgang Struss was tapped to serve as interim president and chief executive officer of MicroPlanet. In this role, Struss will lead the company’s focus on increasing and financing the market penetration of its “best in class” low-voltage regulator products in Australia.

1970s

William H. Swanson (B.S., Industrial Engineering, 1973)

STEM Leadership Hall of Fame Honoree

William H. (Bill) Swanson was among the honorees at the U.S. News & World Report’s 2014 STEM Leadership Hall of Fame. U.S. News sought out leaders who have achieved measurable results in the science, technology, engineering and math fields; challenged established processes and conventional wisdom; inspired a shared vision; and motivated legions of aspiring STEM professionals.

Swanson is chair of the Cal Poly Foundation board.

Jeff Tolman (B.S., Computer Science, 1986)

Software Engineer’s Career Now in a New Key

Jeff Tolman is the new director of the Petaluma Chorale in Petaluma, Calif. After 18 years working as a software engineer, Tolman decided to pursue a life of music. He moved to Creston, Iowa, to attend the School for Music Vocation, led by famous jazz arranger Phil Mattson; finished his music education at Sacramento State; and moved back to Petaluma, the town he calls home.

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To learn how you can work with student teams or sponsor projects, contact Associate Dean Rakesh Goel at rgoel@calpoly.edu.