Computer engineering (CPE) senior Jeslin James interned this summer at Shopatron in San Luis Obispo, a leading provider of cloud-based, eCommerce order management. Read about CPE’s plans to take such opportunities to the next level (pages 4-5).
Profs had warned Steven Chiu that as a fourth-year computer engineering major, the capstone class and his senior project would consume all of his free time. “But nothing can compare with the amount of time I spent building Cal Poly’s Rose Float,” said Chiu. “It became my life!”

As a “floater” for the past three years, Chiu has helped fabricate his fellow team members’ CAD designs of moving mechanisms along the float frame. His work involved structural welding, cutting the steel, and drilling the holes. In fall 2013, he also served as navigator of the enormous vehicle.

“This meant directing the driver any time we moved to make sure we didn’t crash into anything,” he said. “Driving a vehicle that’s 55 feet long, 18 feet wide and 16 feet tall while looking out of a tiny window isn’t the easiest thing in the world to do, so I stepped in to help.”

Eager to stay on track for the New Year’s Day Rose Parade, the conscientious team met most every Saturday during fall quarter, working from 9 a.m. to 5 p.m. or longer. Halfway through the quarter, half of the float was loaded onto a semi-truck for transport to Pomona by an agriculture professor, explained Chiu.

“Once our portion of the float was in Pomona, our Saturday labs started at 6 a.m. with a four-hour drive,” he said. “We usually worked until 6 p.m., then grabbed some food and hit the road, getting home around 11 or 12, if not later.”

Joining other team members who continued working into winter break, Chiu devoted two weeks of his three-week vacation to help finish building and decorating the float in time for judging on Dec. 31.

“The team spent a lot of long nights fine-tuning the animation with our National Instruments data acquisition chip, making sure the timing was right and parts wouldn’t break or collide,” he noted. “But naturally, things do break, and it happened at the worst time possible — eight hours before the start of the parade.”

The tow hitch had snapped off, and on-site team member Brandon “Blue” Bussjaeger called Chiu to the rescue.

“The next thing I know I’m fixing the float at 2 a.m.,” said Chiu. “Three hours later, the job was done, just in time for a nap before the parade.”

He added, “Even though I’m a computer engineer on paper, I’m really a floater in life!”
Choosing to attend Cal Poly was easy for Doug Gallatin when he realized he could pursue two of his passions: embedded systems and the flute.

“I came to Cal Poly for a number of reasons, chief among them being Cal Poly’s stellar engineering program and the inclusive Music Department,” said Gallatin. “Uniquely, I could split my time between them.”

Adding math studies to the equation divided his time even more. In March 2014, he graduated with a blended master’s degree in computer science with a bachelor’s degree in computer engineering (CPE) and a minor in math.

Gallatin’s favorite CPE classes were 129, 233 and 329 — the embedded systems track — in which he worked on a mock T1 communications link, a microprocessor and a remote-controlled micro quad-copter, learning VHDL, assembly and C.

His interest in the embedded systems emphasis continued in his capstone class, a senior-year collaborative effort spanning two quarters. “I helped build a small fleet of autonomous and much more robust quad-copters,” he said. “Embedded systems were also the emphasis of my graduate studies, which included almost as many electrical engineering classes as computer science classes.”

In those classes, Gallatin explored field programmable gate array- (FPGA) based security systems and random-number generators, real-time audio filters and hybrid microprocessor-FPGA systems.

“Even in my thesis, I pursued a distinctly CPE topic in developing a hybrid hardware/software compiler to exploit latent parallelization in single-threaded C programs,” he said.

As busy as the engineering coursework kept him, Gallatin didn’t neglect his flute.

“I had the pleasure of playing principle flute with the Cal Poly Wind Ensemble and the Cal Poly Symphony, performing with the Cal Poly Woodwind Quartet and directing the Cal Poly Flute Choir,” he said. “Although I was a non-major, the Music Department welcomed and encourage me, even helping to provide weekly music lessons through excellent applied instructors and occasional master classes by professional flutists. They also gave me the opportunity to perform solo works in front of both the Wind Ensemble and Symphony, which were amazing once-in-a-lifetime experiences.”

After graduation, Gallatin was hired at Microsoft to work on the Xbox operating system team.

“It’s a wonderful opportunity to put my CPE knowledge to good use,” he said, crediting his productive but fun four-and-a-half years at Cal Poly. “The experience prepared me for a wonderful career, while letting me develop, expand and refine my favorite pastime.”

**FUN FACT:** About 60 percent of the Mustang Band is composed of engineers — evidence that creativity and engineering go hand-in-hand.
When Growing Grounds Farm contacted Cal Poly to solicit help with a technological problem, seniors in the Computer Engineering program (CPE) were ready for the challenge.

The nonprofit wholesale nursery needed a more efficient way of managing their inventory of native and climate-adapted plants. The staff had been manually recording the number of plants available and entering the data into a cumbersome database.

Students in CPE's senior-level capstone class eagerly put their heads together and produced a solution. Team members David Cilva, Ryan Suarez, Alvin Feng and Lia Zadoyan developed a mobile app that could run on a tablet, enabling the Growing Grounds staff to record plant inventory in the field. CPE senior Javier Balandran helped out, refining the technology to track plants using a scanner to record data through the tablet interface.

"By creating a simple barcoded plant tag that a scanner could read, the staff can now track and record inventory in one efficient step," explained Balandran.

The Growing Grounds project is not only an example of what computer engineers can do, but it also illustrates the demands of an increasingly technologically advanced world.

"We must take Learn by Doing to the next level," said John Oliver, director of Cal Poly’s Computer Engineering program. “It's not enough to prepare our students for an engineering career. They must be ready to take on the tremendous challenges facing all of us in today's world.”

CPE senior Javier Balandran helped develop an inventory tracking system for Growing Grounds Farm, a nursery in San Luis Obispo.
The Next Level for CPE

The CPE faculty and industry advisors are no strangers to working in a truly multidisciplinary program. After all, CPE’s foundation was built on a blend of computer science and electrical engineering studies. For Cal Poly and the College of Engineering, such an integrated course of study is still unique today. “The challenge for the CPE program is to move toward learning environments that are increasingly collaborative and inclusive,” said Oliver.

Integrated Learning Experiences: CPE+

Like all Cal Poly students, CPE students typically enjoy the classes in their major, but are challenged when applying their technical skills in non-technical situations. CPE proposes to integrate general education materials into computer engineering classes to connect technical material with a broader range of topics. A group of CPE faculty led by Professor Lynne Slivovsky is working to develop such a progressive learning model.

“We want to embed general education into the capstone course, for example, and discuss societal and ethical considerations within the context of real-world projects,” said Slivovsky. “In order to engage the complexity of the world of tomorrow, we must take a holistic approach to engineering, one that requires attention to context. Integrating general education with the capstone provides an opportunity for students to develop the competency and agency to do just that.”

Early Industry Experience in Co-op+

CPE students have always been in high demand by industry. But as engineering problems have become increasingly more complex, engineers need to be more knowledgeable. While summer internships provide valuable experience, the limited timeframe impacts a student’s learning curve and ability to fully demonstrate his or her capabilities to prospective employers.

“We feel that a six- or 12-month assignment would better serve our students and industry partners,” said Oliver. “Expanded industry experience is a win-win for the corporations and students alike. A secondary goal of the co-op program is to expand the number of CPE students with industry experience prior to graduation. Some students may have had a rough time in their freshmen year, but have since become amazing students. These students, whose GPAs are lower than typical, are extremely qualified but under-selected for industry employment.”

Fostering Diversity

“Diversity is one of the qualities reflected in a robust community,” said Oliver. “It’s imperative for our program to foster diversity if we expect to survive in the future.” And he is actively working to break through the myth that computer engineering is only for students who like technology or are good at programming and math.

Diversity is important in design, and therefore, in the designer, Oliver noted. To promote diversity in the student body, the CPE program is creating partnerships with student organizations like Women in Software and Hardware and the Multicultural Engineering Program. Other diversity efforts include a strong mentoring programs for students, as well as marketing strategies. “We’re rebranding ourselves to broaden our appeal and build bridges with typically underrepresented students,” he explained.

The Next Step

“In a perfect world, CPE would implement all enhancements immediately, but we need a little help,” said Oliver. “Generous support from parents, alumni and industry partners will enable CPE to offer a ‘next level’ of Learn by Doing. We are also striving for ways to enable our students to tap the expertise of CPE alumni.”

For information about how you can contribute, visit cpe.calpoly.edu/invest/.
By Joe Grimes

It is sad to note the passing of Leonard “Len” Myers, Computer Engineering (CPE) director from 2003-06 and Computer Science Department faculty member from 1984-2006. Len exemplified the ideal faculty member who brought heart, mind and hands to the program. A significant contributor to the success of CPE students, he expressed, “Without question, the biggest success of CPE is our students.”

Len was born in Bloomington, Ill., in December 1940 and grew up there, graduating from Bloomington High School. He earned his bachelor’s and master’s degrees from Illinois State University (ISU) and his doctorate from the University of Kansas. Before arriving at Cal Poly, he taught at ISU and established the Computer Science program at the University of Wisconsin-Platteville (UW-P). While teaching at the latter from 1972-84, Len met Hope, a UW-P secretary. The couple later married at the Coalesce Chapel in Morro Bay. He was a member of the Baywood Navy and was active in Kiwanis. He loved his 9-year-old golden retriever-chow mix, a rescue dog named Auggie.

Len’s interests included oil painting and art, creating art mugs and tiles for other artists, watching movies with Hope, playing guitar, and working on landscaping projects. He was a member of the Baywood Navy and was active in Kiwanis. He loved his 9-year-old golden retriever-chow mix, a rescue dog named Auggie.

Len was a recipient of multiple teaching awards at UW-P and was honored with Cal Poly’s Distinguished Teaching Award in 1998-99.

In his earlier years at Cal Poly, Len used some cute ploys in the classroom. On occasion, before students arrived, he would place a white peppermint stick in the chalk tray. During a lecture, after having used the chalk on the board, he would pick up the candy and chew on it, to the students’ amazement. When the Macarena became popular, he brought a wind-up Macarena gorilla toy to class. If a student missed a question, Len would have her/him emulate the dancing gorilla.

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Len Myers (below, in graduation cap) at the 2007 CPE Banquet with colleagues (from left): Jim Harris, Art MacCarley, Joe Grimes and Albert Liddicoat.

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Len and I graduated from different high schools in the same town in the same year. We worked on our master’s degrees in the same department at the same university at the same time. However, we did not meet until he arrived at Cal Poly. I was fortunate to be a colleague and friend of this wonderful man who was dedicated to his profession, but even more dedicated to his family.

Len is survived by his wife, Hope, of Los Osos; his first wife, Charmaine, of Colorado; their children, Katrina Myers of Colorado and Kerry Dallmann of Wisconsin; grandchildren, Olivia, Keegan, Erika, Nathan and Geoffrey; and brother, David Myers and his wife, Doris Jean, of Illinois. Len was preceded in death by his parents, Frederick and Mildred Myers, and his son, Eric Myers.

Andrew Danowitz with Sage

DANOWITZ JOINS FACULTY

Having a passion for teaching and practical applications of engineering concepts are key traits of Cal Poly engineering professors, and Andrew Danowitz is no exception. Danowitz will bring his energy and expertise in digital design, very large-scale integration (VLSI) and computer microarchitecture to campus when he joins the faculty of Cal Poly’s electrical engineering and computer engineering programs this fall.

“I was drawn to Cal Poly because of its emphasis on teaching and focus on student success,” said Danowitz, who earned his bachelor’s degree in engineering at Harvey Mudd College and his master’s and doctoral degrees in electrical engineering at Stanford University.

As an undergraduate at Harvey Mudd, Danowitz’s first teaching experience was in front of a digital design class. “I realized that I really enjoyed sharing the magic of digital design with others,” he recalled. “My interest in helping others learn continued at Stanford, and from that point on, I knew I wanted to be a professor.”

Danowitz said his enthusiasm has grown with his knowledge of teaching.

“It’s important to me not only to teach engineering concepts, but to show their tangible applications,” he explained. “Whether it’s demonstrations with 3-D LED cubes or building a DIY useless box, my guiding principal remains the same, which is ‘hands-on practical knowledge sparks excitement in learning.’”
Just three years after graduating, Andrew Hughes is the founder of Steadfast Innovation LLC and the creator of Papyrus, a popular Android and Windows Phone app.

Like many alumni, the 25-year-old entrepreneur credits Cal Poly’s superior faculty and Learn by Doing approach for his success, but it was his copious note-taking as a student that inspired his app.

“I took a lot of notes,” said Hughes (B.S., Computer Engineering, 2011; M.S., Electrical Engineering, 2011). “Every quarter I bought new notebooks, carried them around for different classes, and stored them at the end of each quarter to make room for the next set of notebooks. I wanted to keep them all for future reference, but they just ended up in boxes in my closet.”

The challenge had Hughes wishing he could take notes digitally. He noticed that Professor John Seng used a tablet PC to annotate PowerPoint slides in his favorite class, Computer Architecture.

“After every class, Dr. Seng would email us the final slides with his class notes,” said Hughes. “This inspired me to get a tablet PC for taking notes in class, but it left a lot to be desired.”

Hughes and his roommate, Kyle Husmann (B.S., Electrical Engineering, 2011), wondered why no one had created a tablet with smartphone parts instead of PC parts.

“Clearly, there was a market for thin, lightweight, all-day-battery-life tablets that could be used to take notes, among other things,” said Hughes. “Not long after that, the iPad came out, followed by Android tablets, but none had pens like the tablet PC.”

Their shortcomings inspired Hughes’ master’s thesis on adding active pen support to Android devices.

“I was determined to help improve the modern tablet by giving manufacturers the ability to add pen input to their devices,” he said. “Shortly after I graduated, the first active pen-enabled Android tablets started coming out. I had the idea in my head for a handwriting, note-taking app that took advantage of active pens, so I started developing it full time.”

Nine months later, Hughes introduced Papyrus, an app that enables users to write notes on Android devices using an active pen, passive stylus or a finger. Soon after its release, he officially formed Steadfast Innovation LLC with Professor David Janzen, his android application development instructor, signing on as co-founder.

But support from Cal Poly didn’t end there. “Even after I graduated, Cal Poly helped me get a head start through the HotHouse in the Center for Innovation & Entrepreneurship,” said Hughes, explaining that the campus program offers students and recent alumni an opportunity to launch their business ideas.

“I developed so many helpful contacts and mentors through that experience.”

Papyrus’ popularity has generated excitement for Hughes and his team about what the future holds for the company and its products and gratitude for the continued Cal Poly connection.

“I’m so thankful for Cal Poly’s influence and support of our business,” he said.
Alumna Jen Overgaag (B.S., Computer Engineering, 2005) addressed more than 12,000 prospective students who attended the College of Engineering’s New Student Day activities in April, held during Cal Poly’s 2014 Open House. Her presentation was titled “Engineering for Good.”

Shown here visiting with College of Engineering Dean Debra Larson, Overgaag works as a field network consultant for EducationSuperHighway, an organization whose mission is to upgrade Internet access in public schools nationwide. For more information, visit www.EducationSuperHighway.org.

Singing Engineering’s Praises

An Invitation to Alumni and Friends

The CPE program invites your contributions to support Learn by Doing! It’s as easy as visiting cpe.calpoly.edu/invest/. CPE faculty and students will appreciate your help in ensuring that all CPE graduates are day one ready when they enter the industry.