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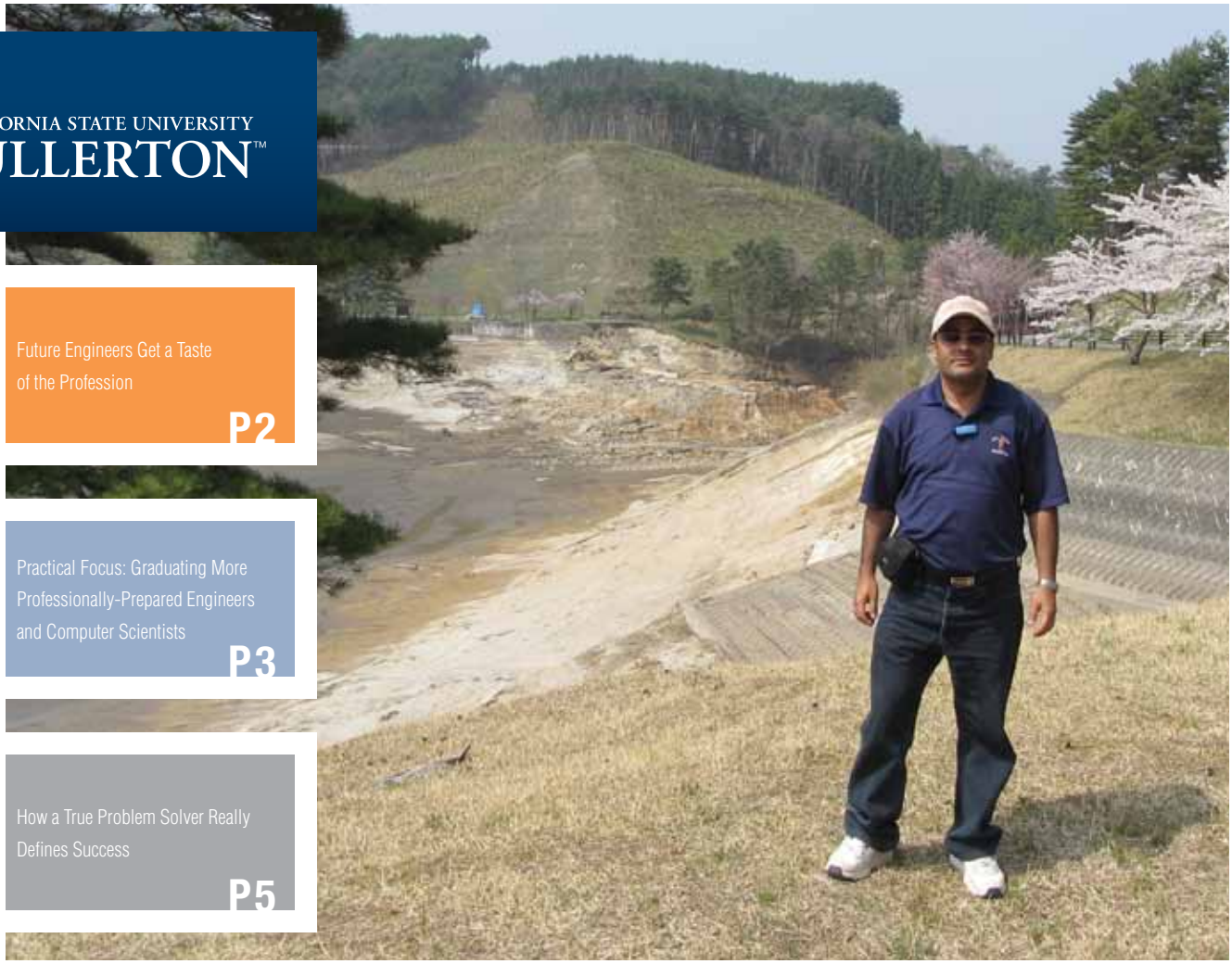


CONNECTION

NEWS FROM THE COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Issue One // Fall // 2011

Field Research: Lessons Learned From Post-Event Observations in Japan

When Binod Tiwari, assistant professor of civil and environmental engineering at Cal State Fullerton, volunteered to go to Japan directly after the March earthquake and tsunami that devastated much of that nation's Pacific coastline, it was a decision made from the heart.

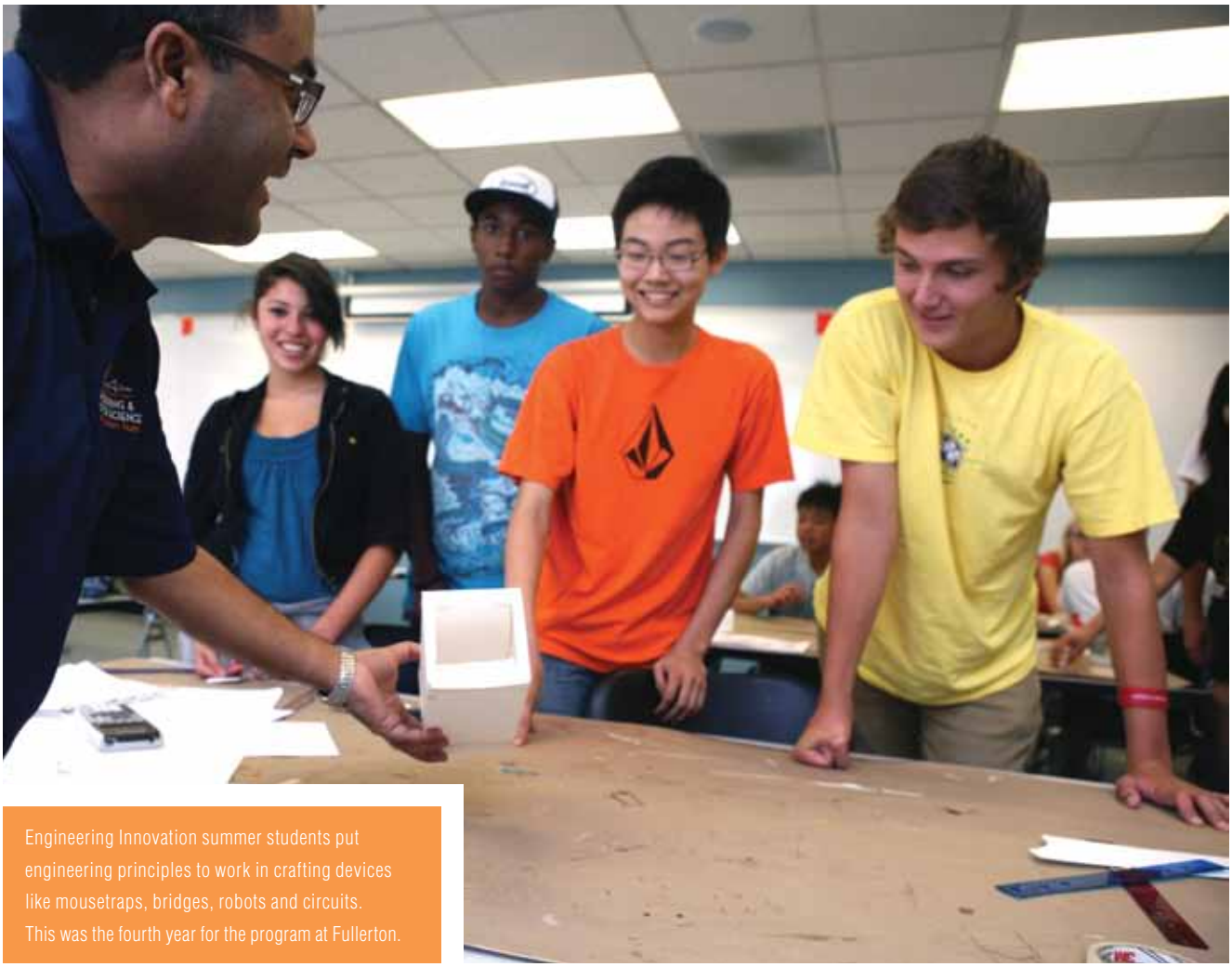
"I have a sentimental attachment to Japan. More than anything, it's a chance to pay them back for all they did to help me get a higher education," says Tiwari, a Nepal native who spent seven years in Japan earning his master's degree and doctorate.

Tiwari joined two other civil engineers – Joseph Wartman, a University of Washington associate professor of civil and environmental engineering and chair of the Geo-Institute Committee on Embankments, Dams and Slopes; and Daniel W. Pradel, chief engineer for civil engineering company Praad Geotechnical Inc. and adjunct professor at UCLA – under the auspices of the American Society of Civil Engineers (ASCE). Together they visited Tokyo and northern areas to study the impact of the earthquake and tsunami on the region's infrastructure and public safety.

Pictured Above: In Japan, Binod Tiwari surveys a dam failure site shortly after the March earthquake and tsunami.

"We spent 10 days in Japan," says Tiwari. "During the day, we were busy collecting data on site and in the evening we were busy discussing and compiling our analysis

continued on page 4 »



Engineering Innovation summer students put engineering principles to work in crafting devices like mousetraps, bridges, robots and circuits. This was the fourth year for the program at Fullerton.

Future Engineers Get a Taste of the Profession

If you learn to think like an engineer, you learn how to solve problems. Twenty high school students, who spent the month of July learning how to do just that, now have a real taste for discipline and a sense of how they can apply that skill to a myriad of vocations.

The Engineering Innovation program, made possible through a partnership with Johns Hopkins University in Baltimore, is part of the university's effort to expose more students to education and careers in engineering. It is now in its fourth summer.

Not only did participating students get a preview of the academic rigor of a top-notch university engineering program – they managed to have a lot of fun in the process. They engaged in plenty of hands-on activities where they put civil, electrical, electronic, and mechanical and computer engineering concepts to the test. This summer's participants crafted mousetraps – and user-friendly instructions – using paper, glue and rubber bands; they built spaghetti noodle bridges that could handle stress; they conducted chemical experiments, crafted circuits and made robots.

"During the program, we expose students to the different engineering disciplines which open their eyes to all the possibilities in the field," says Binod Tiwari, assistant professor of civil and environmental Engineering, who teaches the program along with Johns Hopkins teaching fellow, Christopher Peoples, a Sunny Hills High School physics teacher.

That experience helps high school students discover whether they have what it takes to go to college and to be an engineer.

"If I can pass this course, then I know I can do any engineering class in college," said Meredith Fleming, who is interested in aerospace and mechanical engineering and is a junior at Corona del Mar High School.

On the other hand, Christine Rivas, a Santa Ana High School senior, had no idea what engineers do – before she took the course.

"I wanted to see what engineering is all about. Now I understand much more, and the program has shown me my weaknesses and strengths."

While Rivas enjoys math and science, she's unsure whether she will pursue engineering. But one thing is for sure, she plans to go to college.

"After taking this course, when I go to college – on the first day – I won't feel so lost. I'll know what to expect," she said.

Practical Focus: Graduating More Professionally-Prepared Engineers and Computer Scientists

Health, industry, technology and commerce all rely, in some aspect, on the expertise of the engineering and computer science professions. That makes attracting, retaining and graduating more students who are professionally prepared as engineers and computer scientists an important goal for both academia and American society.

Increasing student interest in engineering and computer science, delivering an education experience that integrates technical knowledge and practical skill, and working with students to make sure they graduate are key areas of focus for Cal State Fullerton.

"We have multiple programs that reach students pre-college, provide support to them while in college, and expose them to practical work experiences as part of their undergraduate studies," says Raman Unnikrishnan, dean of the College of Engineering and Computer Science.

Some of those programs include:

The Engineering Innovation program, initiated in 2008, gives high school students the opportunity to explore engineering careers over the summer. The students receive exposure to the Fullerton campus and engage in hands-on activities where they put civil, electrical, electronic, mechanical and computer engineering concepts to the test. The program is in partnership with Johns Hopkins University in Baltimore.

The *ECS Scholars* program is a learning community for underrepresented minority first-year students majoring in engineering or computer science. Participants take core classes together and attend study group sessions that support their academic growth. Study group sessions are led by qualified tutors who have experience working with students and facilitating learning. The ECS Scholars program is a collaborative effort between the **Center for Academic Support in Engineering and Computer Science (CASECS)**, the **University Learning Center (ULC)**, and **Cal State Fullerton Title V Programs**. It won the Excellencia Semilla national award in 2009 for being an exemplary and successful initiative that supports Latino student access in engineering programs.

The Peer Group Program is for first-year students in math, science, engineering and computer science. A peer advisor serves as a group facilitator of weekly meetings to help first year students establish a support network and connect them with current students and campus resources.

Internship experiences are key in empowering Fullerton engineering and computer science students to apply what they have learned to real-life situations. Corporations like Boeing partner with the college to provide on-site work experiences as well as work-life mentors for interns.

Support programs underpin an academic course of study that purposefully mixes foundational and specialized engineering curriculum with courses in the arts, humanities and social sciences.

"We provide an academically rigorous program in order to make sure our graduates are well versed in analytical thinking, practical skills and professional judgment," explains Dean Unnikrishnan. "Between that and the support programs, we are confident we can get more students in the pipeline, and graduate them successfully."

From The Dean

Welcome to the *ECS Connection*, a College of Engineering and Computer Science newsletter. The purpose of the *ECS Connection* is to communicate the programs, achievements and needs of our talented faculty and students to our alumni, donors, peer institutions and the business community. By doing this, we hope to convey to you the progress ECS is making toward student and faculty achievement and inspire you to take a closer look at our potential and invite your support and involvement.

A few highlights of the previous academic year include:

- Exceeding enrollment targets for Fall 2010 (and Fall 2011),
- Establishing the Control Systems Laboratory to enrich undergraduate and graduate eduction in ECS,
- ECS faculty won three new research awards bringing the number of ongoing externally funded projects up to seven for a total of $1,498,999 over the last three years, and,
- Three of four approved tenure-track faculty positions were filled in Civil & Environmental Engineering, Computer Engineering, Computer Science and Mechanical Engineering.

ECS continues to expand our curriculum and graduate programs. Building on the success of our online MS in Software Engineering, our proposal for an online MS in Environmental Engineering was approved by the Chancellor's Office and is pending approval by WASC (Western Association of Schools and Colleges). Our proposal for an integrated BS/MS in Computer Engineering is pending University approval.

International activities continue to provide growth opportunities for ECS as well. The College entered into a licensing and training partnership with the Duy Tan University, Vietnam, for an undergraduate curriculum in Civil and Environmental Engineering. We have also signed a letter of intent to seek a joint BS/MS program with electrical engineering and computer science programs at Bahra University in Shimla Hills, Himachal Pradesh, India.

Each of these activities is an example of the strength and quality that students, faculty and business find here in ECS. I hope you will join us as we continue our pursuit of excellence here at the College of Engineering and Computer Science at California State University, Fullerton.

Raman Unnikrishnan, PhD
Dean

Binod Tiwari and his team visited more than 50 places where failures occurred in dams, embankments, and natural as well as man-made slopes. Pictured here is the aftermath of a landslide.

Field Research: Lessons Learned From Post-Event Observations in Japan

(continued from page 1)

of each event. We visited more than 50 places where failures occurred in dams, embankments, and natural as well as man-made slopes."

From dam failures to landslides, Tiwari and his team were careful to comprehensively record their findings. "I took more than 2,500 pictures," he explains. "We saw several kilometer-long continuous ground ruptures that occurred after the aftershock of April 11 – the first time for all of us to observe such a long rupture – and many embankment and slope failures due to the devastating tsunami."

For Tiwari, a world-renowned expert on landslides and slope failure, such work was not an assignment but an honor. "I'm glad I could help Japan, and also benefit my students and the university by sharing my experiences on this project," he says.

Tiwari and his team worked with Japan's Landslide and Geotechnical societies, along with top-level government officials, to focus on the seismic performance of earth and rock fill dams, embankments, levees and natural or modified slopes, such as slopes adjacent to highways. They studied both the distribution and characteristics of the failures of these structures and documented the effects on highways, rail lines, structures, pipelines, and dams.

According to Tiwari, "This event proved to be a learning opportunity. We now better understand that when a disaster like this happens, the side effects can be more devastating. It is our hope that the data we collected and our final report will help Japan and the United States be more prepared for disasters and subsequent side effects."

Experts agree that the lessons learned from the Japan earthquake and tsunami should be applied to the United States – and that is one of the reasons ASCE called on Tiwari. The ASCE is responsible for the standard which governs the Minimum Design Loads (weight) for Buildings and Other Structures. Currently, the standard for all coastal flood minimums in the United States is based on hurricane conditions; they have never been evaluated for tsunami wave conditions.

Tsunami conditions are a possibility for the West coast of the United States. Should an earthquake the magnitude of the Japan quake occur off the West coast, Washington, Oregon and northern California coastlines could experience a tsunami inundation within 15 minutes. Because of the industrialized and densely populated nature of the Honshu Tohoku coastline, and the similarity between Japanese and U.S. building codes, lessons from the recent tsunami will be immediately relevant to the U.S. West Coast, Alaska, Hawaii, and Canada.

Tiwari hopes his experience will also prove beneficial to his students – with whom he is anxious to share his findings.

"I have much to relay to my students as a result of this trip," he says. "The first-hand information I collected from this post-disaster survey will be an asset to my students, my department and me for several years."

One of Tiwari's top priorities is to share the importance of reckoning with natural events.

"A textbook-type design simply following the building code doesn't work in real life. While planning and designing any infrastructure, we have to look at the big picture of location and design and foresee the potential of Mother Nature," he says.

How a True Problem Solver Really Defines Success

One of the college's most dedicated alumna – and an accomplished leader in her field – describes two skills that have been keys to her success: leadership and problem solving.

Those abilities have carried **Joan Tang Waltman**, ('85, EE) far. For 20 years, starting in 1990, she was part of the strategic innovations in technology, business and operations at Qualcomm Incorporated, a pioneer and leader in digital wireless technology. There she also led one of the first software as a service (SAAS) businesses for the supply chain industry; provided leadership for the development of the first wireless backend platform for the CardioNet heart monitoring solution; and worked hand-in-hand with Amazon to develop the first wireless backend services for the Kindle eBook reader.

"I enjoy problem solving, and I see most challenges as big puzzles," she says. "Every now and then, all the pieces start to come together in an 'a-ha!' moment. Then the fun of creating a goal and an execution plan can begin."

Most recently that problem-solving skill propelled Waltman out of corporate America and into entrepreneurship. "While my 20 years at Qualcomm were probably the most fulfilling career experience I could have imagined, today I'm excited to say that I'm helping start-ups and established businesses," she explains.

"I'm using my experience to focus and understand the real problems that people and/or businesses are faced with, and then using that information to leverage technologies, organizations, and leadership to accomplish goals. It all comes down to this: you can't try to fix something until you really understand the problem."

Waltman credits her educational experience at Fullerton as foundational to her success as a problem solver. "The variety and breadth of appreciation for other subjects required for graduation ended up being more important than I had appreciated at the time I was a student."

"I received a solid education with an emphasis on teaching and learning, exemplified by professors who were present and involved with the students," says Waltman. "That helped keep me engaged and I enjoyed the experience of learning in a deep way."

That pride in Cal State Fullerton is a family affair: Waltman met her husband, a pre-med/biology/chemistry major, at Fullerton. The older of their two sons is a sophomore at Fullerton in the College of Engineering and Computer Science.

"My education at CSUF provided a foundation for being a life-long learner, and our family has integrated that philosophy into how we live our lives," she says.

Key to Waltman's personal success is a deep commitment to community. She is a member of the CSUF Philanthropic Foundation Board of Governors and is a member of the CATLab initiative at CSUF, which will promote the development and research of new products, services and technologies to support the aging population and their desire and need to "age in place."

"There is a tremendous need for these sorts of efforts in our society today to prepare us for the future," Waltman asserts. "This endeavor is especially exciting because it brings together the colleges of Engineering and Computer Science, Gerontology, and Humanities and Social Science, working in conjunction with the community and other colleges as the opportunity develops."

Waltman finds this work, as well as almost all her other initiatives, gratifying in ways that bypass the typical corporate definition of "success."

"Quite a while ago I discovered what it was about working that I really enjoyed. Interestingly enough, it wasn't the idea of climbing the corporate ladder," she says. "I realized that I loved to work with and help others – my engineering and business background was really just a means to that end."

Faculty Focus

Awards and Grants

Professor Jeff Kuo has received the 2009–10 Carol Barnes Faculty Excellence Award, for his academic rigor and excellence in teaching. Kuo is one of two university professors awarded fellowships by the CSUF Center for Sustainability to support research for the center and the Anaheim Center for New Energy Technologies (AC-NET) focused on energy sustainability and efficiency. He was also awarded a grant from the U.S. Environmental Protection Agency, which allowed him to travel to China in April to give workshops on methane recovery techniques and methane's use as a clean energy source. He is currently working on two methane emission studies in California funded by the State Energy Resources Conservation and Development Commission and the California Air Resources Board. Kuo has been with the College since 1995.

Professor Kiran George, has been awarded a grant from the National Science Foundation in support of "BRIGE: Implementation of a Multi-Signal Real-Time Digital Receiver with High Resolution Spectral Estimation Capability on a Hybrid High Performance Computing Platform."

Promotions and New Faculty

Professor Shawn X. Wang has been promoted from assistant professor to professor.

The department welcomes **Ukson Kim**, associate professor of civil engineering and environmental engineering.

International Collaboration

Dr. R. Unnikrishnan, Dean of Engineering, **Dr. Mo Shiva**, Chair of Electrical Engineering and **Dr. Mariko Molodowitch**, Chair of Computer Science recently visited Bahra University in Shimla Hills in India. Bahra University is seeking collaboration with CSUF for blended BS/MS programs in electrical engineering and computer science.

Retirements Announced

Pinaki Chakrabarti, PhD, PE, SE, FASCE, professor of civil and environmental engineering

Young Kwon, professor of electrical engineering

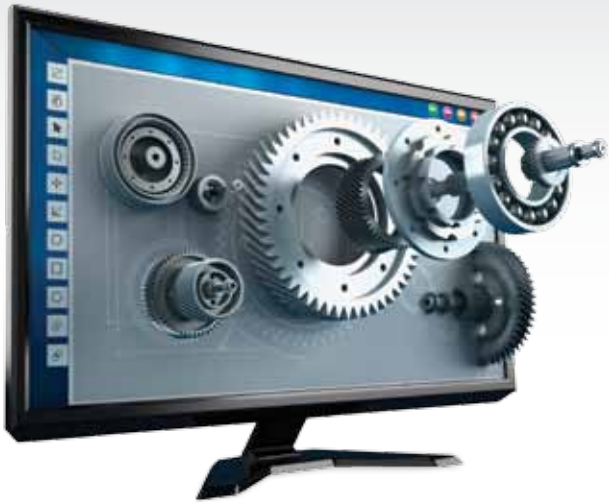
Demitrios Michalopoulos, professor of computer science

Mark Murphy, lecturer in computer science

Fazlur Rehman, lecturer in mechanical engineering

Faisal Zahlout, lecturer in civil and environmental engineering.

Support the College of Engineering and Computer Science.



Your gifts, your service and your talent are fundamental to our goal of preparing graduates to solve 21st century problems.

HERE'S HOW YOU CAN GET INVOLVED WITH THE COLLEGE:

Charitable Giving – direct financial support, in-kind gifts of equipment or hardware, corporate-matched gifts, testamentary bequests and designations

Mentoring – share your career development experiences in the classroom, mentor an aspiring professional, or serve in an advisory capacity to a department or program

Industry Connection – link the college with your company – we're continually seeking partnerships that provide internship and employment positions for our graduates, research and development opportunities for faculty, student project and club sponsors, and industry links that help facilitate curricular currency

For more information about getting involved with the college and gift planning, please contact:

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Cal State Fullerton Philanthropic Foundation
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Student Achievement

Beena Ajmera, (CE, '11) is CSFU's first National Science Foundation (NSF) Graduate Research Fellow. The program is widely considered the most competitive fellowship program of any master's or doctoral program. Ajmera will continue her research on water-saturated slopes of various types of soil and their strength under the weight of large buildings or housing developments.

Jon Haider, (CE, '11) won first place in the Undergraduate Engineering and Computer Science category at the 25th annual California State University Student Research Competition in May. His research, titled "Effectiveness of Friction Dampers of Dissipation of Seismic Energy" showed that these devices are cost effective and efficient in protecting structures from the potential damage that earthquakes can cause. This fall he will begin his graduate studies in engineering at UCLA.

Florian Zitzelsberger, (CS, '11) recently completed an 11-week internship at the San Francisco Bay area Pixar Animation Studios. This fall he will begin his graduate studies in computer science at the University of California, San Diego.

ECS Scholarship Recipients Announced

» Padideh Danaee (Computer Science, Graduate Student) has received the fall 2011 Alumni Association Scholarship.

» Dhwani Shah (Electrical Engineering, Graduate Student) has received the fall 2011 Emmet D. Burnett Memorial Scholarship.

» Michael Stragier (Mechanical Engineering, Junior) has received the fall 2011 Lucas Aerospace Cargo Systems Scholarship.

Students who have received fall 2011 Boeing Next-Generation Scholarships are:

» Mohamed Ali (Mechanical Engineering, Senior)

» Jonathan Bernal (Computer Engineering, Senior)

» Myles Cupp (Electrical Engineering, Junior)

» Albert Luu (Civil & Environmental Engineering, Senior)

» Justin Nguyen (Civil & Environmental Engineering, Junior)

» Andrew Soltan (Computer Science, Junior)

Students who have received fall 2011 ECS Dean's Scholarships are:

» Alfredo Higuera, Jr. (Computer Science, Graduate Student)

» Hector Sahagun Ortega (Computer Science, Graduate Student)

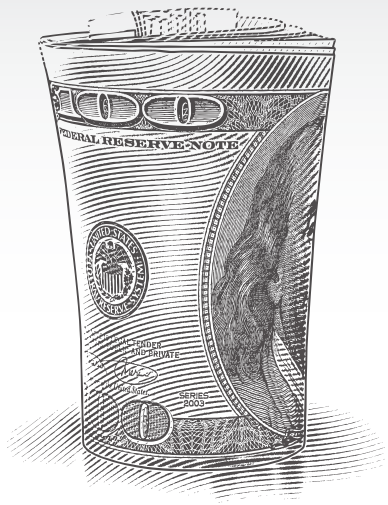
Students who have received fall 2011 Floyd Thomas Scholarships are:

» Manuel Nieto (Mechanical Engineering, Junior)

» Michael Stragier (Mechanical Engineering, Junior)

» Alexander Krochman (Mechanical Engineering, Sophomore)

Degree = Dollars



According to PayScale's annual list of the top highest paying college degrees, engineering continues to dominate. Data indicates the salary advantage that graduates enjoy continues as they move into the middle of their careers.

Rank	Degree	Starting Median Pay	Mid-Career Pay
1	Petroleum Engineering	$97,900	$155,000
2	Chemical Engineering	$64,500	$109,000
3	Electrical Engineering	$61,300	$103,000
4	Materials Science & Engineering	$60,400	$103,000
5	Aerospace Engineering	$60,700	$102,000
6	Computer Engineering	$61,800	$101,000
7	Physics	$49,800	$101,000
8	Applied Mathematics	$52,600	$98,600
9	Computer Science	$56,600	$97,600
10	Nuclear Engineering	$65,100	$97,800
11	Biomedical Engineering	$53,800	$97,800

PayScale, Inc. is the leading online provider of employee compensation data.

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Pumpkins Go Airborne

Fast becoming a community tradition, the annual Pumpkin Launch is set to demonstrate the creativity of engineers and engineering students who will launch pumpkins from home-made catapults, trebuchets, large slingshots and other devices. Sponsored by the College of Engineering and Computer Science, Discovery Science Center and the Future Scientists and Engineers of America, the event features children's competitions in tower building, airplane design and flying, and marshmallow launching as well as music, entertainment and food booths.

ANNUAL PUMPKIN LAUNCH
Saturday, November 5
Rain or Shine
9 a.m. – 12:30 p.m.
Titan Soccer Field

Mark Your Calendar

September 22
Technology Breakfast Series
Raytheon's First Responder Communications Infrastructure

November 3
Technology Breakfast Series
Boeing's Next Generation Net-Enabled Products

November 5
Annual Pumpkin Launch
Titan Soccer Field

For information about these and other events, please contact **Hart Roussel**, hroussel@fullerton.edu, 657.278.5429.