COLLEGE OF ENGINEERING • UNIVERSITY OF CALIFORNIA, BERKELEY

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PEG SKORPINSKI PHOTO

TEA FOR TWENTY

FRAN ALLEN VISITS: Engineering undergrads enjoy a light moment with first female Turing Award winner Fran Allen, left, who made time for a "tea with students" gathering during a visit to Berkeley. Allen, an IBM Fellow Emerita, was on campus last month to deliver the Regents' lecture "The Challenge of the Multi Cores: Think Sequential, Run Parallel." EECS sponsored the event.

Dial 'T' for traffic

Mobile sensor experiment is a first

PHOTO BY ABBY COHN

NO IDLE TIME: Volunteers, like this one in a VW Bug, drove for hours in Bay Area gridlock traffic, all in the name of science.

Berkeley graduate student Kenneth Armijo was stuck in bumper-to-bumper traffic for hours on the Nimitz Freeway. Conditions couldn't have been better for testing a new technology intended to give motorists real-time traffic information and help avoid commuting snarls.

"It was a long day of driving, that's for sure," says Armijo, a 26-year-old ME student who hit the road in a unique experiment exploring the use of GPS-equipped cell phones as traffic monitors. Nearly 150 UC Berkeley students, including many from the College of Engineering, were behind-the-wheel participants in last month's "Mobile Century" test.

Continued on page 2

POP QUIZ

Who is your favorite professor and why?

Johnny Tran
EECS senior

"My favorite has been (George) Necula. I have really enjoyed his classes and he has an effective teaching style."

Paul Tillberg
MSE junior

"Andreas Glaeser. I like how he formulates homework assignments step by step. He's also a real character in class."

Megan Smirti
CEE Ph.D. student

"Mark Hansen. He makes the topic of statistics fun and interesting, and he's excited about transportation."

Steve Jacobs
MSE senior

"Professor (Ron) Gronsky. He's great at describing things and knows how to explain information without dumbing it down."

Traffic

Continued from page 1

Navigating a fleet of 100 cars carrying the special mobile phones, the student drivers traveled up and down a 10-mile stretch of the busy East Bay interstate for more than seven hours. Supported by a grant from the California Department of Transportation, the road test was part of a joint project of UC Berkeley's California Center for Innovative Transportation and the Nokia Research Center.

Speed and location readings were transmitted every three seconds from the cell phones to servers and displayed over the Internet. The result was a computerized map bristling with tiny flags for each car and its velocity, creating a detailed picture of actual traffic conditions.

"We can reconstruct the flow of cars, their speeds and congestion," says Alexandre Bayen, Berkeley CEE assistant professor. Mobile phones of the future could alert motorists to traffic jams and help them select alternate routes, delay a car trip or use public transit, Bayen says.

That would signal a major improvement over current tracking systems, which rely on an expensive network of roadway sensors, radar and cameras, and are mostly limited to metropolitan areas. GPS-equipped phones are already available and are expected to be standard in the near future. Because cell phones are ubiquitous, "there's no infrastructure cost," says Dan Work, a CEE Ph.D. student participant.

Shortly after the cars were deployed, the monitoring system proved it was working. At an outdoor command center in Union City, a display screen showed that northbound vehicles were slowing dramatically. "We captured a five-car accident," Bayen says. "We captured it live time."

Along with testing the technology, the experiment addressed privacy concerns. Researchers say they protected the identity of cell phone users with such safeguards as stripping identifying data from transmissions and using advanced encryption. Owners of GPS-enabled phones would have the option of turning the GPS off.

Looking ahead, researchers hope to conduct an experiment involving 1,000 vehicles.

The project had special significance for Armijo, who is studying vehicular fuel cells. "We can come up with new alternative sources of energy," he says. "But in the end, when cars are sitting in gridlock, they're using energy, whether renewable or not."

By Abby Cohn

SUDOKU

Enter digits from 1 to 9 into the blank spaces. Every row must contain one of each digit. So must every column, as must every 3x3 square. The answer will appear in the next issue. Below is the answer to last issue's puzzle.

9	1	4	8	7	6	2	3	5
5	8	7	3	9	2	4	6	1
6	3	2	5	4	1	8	9	7
8	9	5	7	6	3	1	4	2
2	7	3	1	8	4	6	5	9
4	6	1	2	5	9	3	7	8
3	5	9	4	1	8	7	2	6
7	4	8	6	2	5	9	1	3
1	2	6	9	3	7	5	8	4

2				8				7
	7	3						6
		9		4		1	2	5
5	2	6	3				7	
		7	2		8	6		
	3				9	4	5	2
9	1	5		6		7		
7						2	6	
3				9				1

Puzzle by websudoku.com

Senior Gift goes global

Donations support ambitious COE student groups

Berkeley Engineering students are active in a number of campus groups, as evidenced by the enthusiastic tabling that goes on during E-week. One way these groups can recruit, hold meetings, and undertake projects is by seeking support from the Berkeley Engineering Fund, where donations to the 2008 Senior Gift Campaign are funneled. The campaign aims to raise money to support organized projects like these.

Engineering World Health (EWH) is one such group, a national charitable organization that began in 2001 to improve hospital conditions in the developing world.

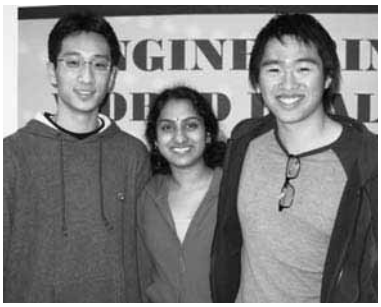
"I think it's a great opportunity to get hands-on experience and a great way to make a difference," says Madhvi Venkatesh, a BioE sophomore and the group's president.

This is EWH's second semester at Berkeley, and already the group's members have put together prototypes of devices to test important medical equipment. They assembled electrosurgery unit testers, small plastic devices that can be sent to hospitals in developing countries to test the surgical equipment for safety. The chapter plans to take part in future summer programs in Costa Rica and Tanzania.

Any student group seeking funding must first register with the Campus Life and Leadership office **(http://students.berkeley.edu/osl/osl.asp),** then begin attending Engineers' Joint Council meetings. Once voted in by EJC, groups can be budgeted up to $1,000 per semester for projects.

Senior Gift Campaign donations are part of the funding that is the lifeblood for groups like EWH. The campaign is seeking donations from seniors like you to help Berkeley Engineering students learn from world-class faculty and participate in student-organized activities that will give them skills to land great jobs after graduation. All senior gifts make an impact on future Berkeley Engineers.

CELESTE ALTUS PHOTO



GLOBAL OFFICERS: From left, EWH's David Liang, Madhvi Venkatesh and Tu Tran

www.coe.berkeley.edu/seniorgift

announcements

Get the complete College calendar at **www.coe.berkeley.edu/events**.

Commencment 2008

The 2008 Commencement will be a traditional all-College ceremony held from 8:30 a.m. to 12 p.m. Saturday, May 24, at the Hearst Greek Theatre. Departmental receptions will follow at various locations on campus. To register for the ceremony and reserve your tickets, go to **www.coe.berkeley.edu/commencement**. There is a six-ticket limit per graduating student. Questions? Contact Dawn Kramer, Commencement manager, at *dkramer@berkeley.edu*.

Because crises happen

The next CEE graduate seminar, "Management of Crises," is scheduled for 5 to 6 p.m. Wednesday, March 5, in 212 O'Brien Hall. Dr. Ian Mitroff, a Haas School of Business visiting professor, leads the seminar. For information on upcoming sessions, see **www.ce.berkeley.edu/seminars/index.php?type=epm**. The series runs through May 7.

E190 placement test coming up

EECS, ME and IEOR majors must pass Engineering 190 in order to graduate. If you are planning to enroll in E190, you need to first take the placement test, which is offered three times a year. The next placement test is 5 to 7 p.m. Wednesday, March 12, in Sibley Auditorium, Bechtel Engineering Center. You do not need to sign up for the test, but you will need to check in with your student I.D. For more information, contact: *tech_comm@berkeley.edu*.

What's the big idea?

The third annual "Big Idea" CITRIS White Paper competition is upon us, with $25,000 in cash prizes for the best ideas that demonstrate the ability of IT to address a major societal challenge. White papers should be 5 to 10 pages long and are due at 5 p.m. April 11. Submit yours in HTML, Word or a PDF by email, *it4society@gmail.com*.

professor minute

PEG SKORPINSKI PHOTO

WITH ME PROFESSOR ARUNAVA MAJUMDAR

Majumdar (Ph.D. '89 ME) is director of the Berkeley Nanosciences and Nanoengineering Institute and joined the Berkeley faculty in 1997. He received a B.Tech. in mechanical engineering from the Indian Institute of Technology, Bombay, in 1985 and earned his Ph.D. for research conducted in the laboratory of Professor Chang-Lin Tien. He holds the Almy and Agnes Maynard Chair Professorship in the College.

What first inspired you to go into engineering?

I was fascinated by flying things: birds, planes, etc. Making small model planes became my hobby when I was a kid. It was fun to see cause and effect between what happened when you changed the shape of the wing and how it would turn. There was no TV when I was growing up, so we had a lot of time during summer and winter breaks, and I used to keep myself busy reading books and doing things with my hands.

To date, what has been the most memorable moment in your career?

There have been so many: Getting into IIT-Bombay for undergrad and into UC Berkeley for grad school (I never thought I could do these). Meeting my wife in Berkeley (never planned for it). Getting my first job as a professor (never thought I would go into academia). Building a microscope and seeing the first temperature maps of a single transistor! Snorkeling in the great barrier reef. I suppose some of these are not directly career related, but my career gave me the opportunity to enjoy life.

If you had a few extra hours, what would you do?

Play cricket, squash or badminton. Hike with my family. Watch movies (I am a big movie buff).

What should students do to ensure a successful career?

Go abroad and see the world. Get exposed to nonengineering issues and people and learn about other fields. Most students getting an engineering education will not be doing engineering 20 years after they graduate. However, they will be solving complex problems, whether it is in business, society or elsewhere, and the analytical skills they gain in engineering will be very valuable. But the context in which they solve these problems is also important, and exposure to those early in a career could be critical.

⟨of note⟩

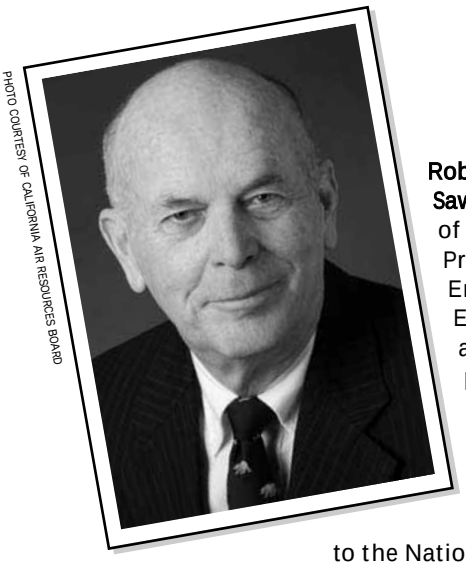


PHOTO COURTESY OF CALIFORNIA AIR RESOURCES BOARD

Robert F. Sawyer, Class of 1935 Professor of Energy Emeritus and professor of the graduate school, has been elected to the National Academy of Engineering. He was among 65 new members and nine foreign associates recently announced by the president of NAE, Charles M. Vest. Sawyer's citation reads: "For pioneering work in reducing energy consumption and improving the environment, and for contributions to our understanding of air pollution."

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'The best job in the world'

Honored EECS alum Peter Norvig innovates at Google

He may be on the cutting edge of leadership in the business world, but his initial career vision was quite different.

Berkeley Engineering alum Peter Norvig (Ph.D.'86 EECS) thought he wanted to be a professor. But, after a few years in academics, he switched to industry.

"I did it in small steps, like decompressing from a SCUBA dive," he says.

Now research director at Google, Norvig last week received a lifetime achievement Berkeley Engineering Innovation Award for his leadership in education, research and industry.

He considers himself lucky. The top of his online resume contains a warning: "Note to recruiters: Please don't offer me a job. I already have the best job in the world at the best company in the world."

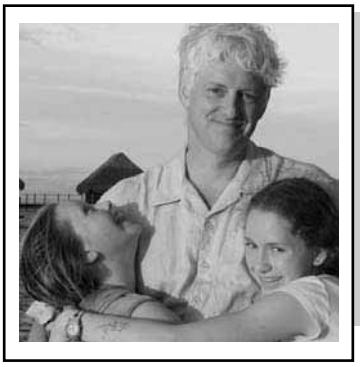

PHOTO COURTESY OF PETER NORVIG

PETER NORVIG, shown here with his daughters, has received a Berkeley Engineering Innovation Award.

At Google, which he joined in 2001, he oversees research projects, finds connections between researchers and product groups, and helps set directions for future products.

"It's like when they asked the bank robber Willie Sutton, 'Why do you rob banks?' and he said 'Because that's where the money is.' For me, the answer to 'Why work at Google?' is 'Because that's where the data is.'"

After getting his engineering doctorate, Norvig says, he felt pressured to go into academia but realized the types of projects he wanted to do required a bigger team than he could muster as a junior faculty member. So he moved to Sun Labs, then to a startup where he focused on new products. Next was a three-year stint at NASA Ames Research Center, a fascinating job in terms of the science, but the bureaucracy got him itching for a change. Impressed with Google's offerings, Norvig approached founders Larry Page and Sergey Brin about working there. After enduring its famously grueling screening process, he signed on and has never looked back.

"The brilliance of my colleagues is amazing. There is the immediate feedback of knowing you are creating a product that hundreds of millions of people use and enjoy every day. And the food really is good," he jokes, referring to Google's famous cafeteria, which serves dishes like beetroot-marinated tofu.

Norvig is coauthor of *Artificial Intelligence: A Modern Approach,* the leading textbook in the field. The married father of two is also an education advocate and develops and supports open-source software. He has spoken at Berkeley, where he gave the 2006 Computer Science commencement address, reminding students that it takes more than just smarts—which Berkeley students presumably already have—to succeed in industry. "What it comes down to is not how smart you are, but rather do you have a record of getting things done?" he asks. "Beyond that, you need to be someone your employer and coworkers will want to work with, someone who is interesting and helpful."

For more information on the Berkeley Engineering Innovation Awards, visit **www.coe.berkeley.edu/alumni** under "events."

www.norvig.com