UC BERKELEY
ELECTRICAL ENGINEERING AND COMPUTER SCIENCES
ELECTRONICS RESEARCH LABORATORY

NEWS

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Inside this issue:

National Semiconductor Lab Opens in Cory Hall

Four rooms on the first floor of Cory Hall have been transformed into a spectacular new lab thanks to a $1.35 million contribution from National Semiconductor. Rooms 121, 123, 125, 127, and 143 were gutted, combined, and rebuilt into one large state-of-the-art computer lab: the National Semiconductor Mixed Signal Systems Laboratory.

EECS 150: *Design Techniques and Components for Digital Systems,* will be taught in the new facility. The lab was increased from 1,800 to 3,400 square feet, and the WWII vintage Navy surplus cubbyholes, tables, and stools that used to fill the rooms have been replaced with 65 ergonomically correct workstations. The lab also hosts a multimedia-equipped command center for the instructor, two wall-mounted plasma displays, a 280-port virtual private network, and a meeting area.

Dean Richard Newton and CEO Brian Halla inaugurating the new lab

"It's amazing, just amazing," said EECS sophomore Amy Tsai, upon seeing the new lab. Senior Ryan Said congratulated himself

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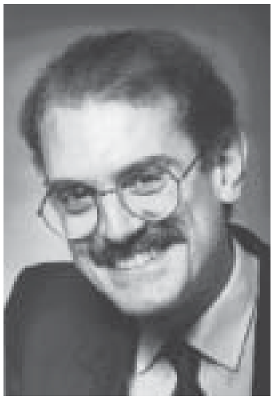
Alberto Sangiovanni-Vincentelli Wins Kaufman Award

The EDA Consortium, an association of global companies developing design solutions and services that enable engineers to create electronic products, has chosen EECS professor Alberto Sangiovanni-Vincentelli as the 2001 recipient of the prestigious Phil Kaufman Award. The consortium honored Sangiovanni-Vincentelli on Thursday, November 8, at its annual award ceremony at the Fairmont Hotel in San Jose.



Alberto Sangiovanni-Vincentelli

Sangiovanni-Vincentelli is a world-renowned authority on circuit simulation, computer-aided design of integrated circuits, logic synthesis, and system design. As a member of the National Academy of Engineering, he holds the highest professional honor for an American engineer.

Sangiovanni-Vincentelli currently holds the Edgar and Harold H. Buttner Chair of EECS and is the vice-chair of Industrial Relations. He has taught at Berkeley since 1976. He also is a member of the advisory board of the Lester Center of Entrepreneurship and Management of Technology of the Haas School of Business, a member of the

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New Assistant Professor Jennifer Mankoff Specializes in Assistive Technology

Jennifer Mankoff, who began her EECS faculty position last semester, already has five research projects under way for the Group for User Interface Research (GUIR). Two are in collaboration with adjunct professor Anind Dey and four are in collaboration with different graduate and undergraduate students. Two projects focus on improving the computing experience for the disabled, using assistive technologies; one scans grocery receipts and responds with advice on nutrition; one deals with privacy in ubiquitous computing; and another explores ambient displays, combining data with art. Immediately following the terrorist attacks in September, she established a web site for checking and posting the status of loved ones in New York. This quick adjustment to a new situation, and ambition to tackle new challenges, seems typical of Mankoff.

She credits her father with instilling a love of math in her from an early age, and her mother, who was programming with punch cards (using a knitting machine) long before Mankoff started using computers, with teaching her to construct and create. Mankoff says, "computers fascinated me, and were a great creative outlet to boot." She attended Oberlin College as an undergraduate and studied viola at Oberlin's conservatory. She was in graduate school at Georgia Institute of Technology when a repetitive strain injury from keyboard use made it difficult for her to tie her shoes or hold a glass of water.

Jennifer Mankoff and "Demi"

"I lost pretty much all my hobbies—painting, knitting, playing the viola—because I couldn't use my hands," she says. She tried using voice recognition tools that translate spoken words into written language for the computer, and found that they affected her voice. She considered going to veterinary school, and took organic chemistry and molecular biology classes in preparation. She also had to find a new hobby. A friend trained dogs to serve as companions for the disabled. Mankoff raised two puppies for Canine Companions for Independence. When one, Demi, failed the test, Mankoff kept her as a pet. "She really doesn't want a career. All she wants to do is stand in water and run after tennis balls."

As her wrists slowly recovered, Mankoff became interested in building systems that would help others with physical disabilities. She decided to go back to computer science but focus on assistive technology. In graduate school she also joined a project supporting someone who was completely paralyzed. He was mentally competent, but unable to speak and able to perform only the tiniest eye movements. The project group situated an implant into the motor cortex of his brain that allowed him to control a mouse. At

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Berkeley Alum Ali Niknejad Joins Faculty

Ali Niknejad knew exactly what the Berkeley environment would be like when he decided to take an assistant professor position in EECS. After all, he received both his master's and PhD degrees here, working with his advisor, professor Robert Meyer. His PhD work was on the analysis and impact of integrated passive components for wireless communication integrated circuits. In the process he developed a CAD tool called ASITIC (Analysis and Simulation of Inductors and Transformers for ICs) that can aid engineers in the design and simulation of such structures.

Niknejad discovered his passion for engineering as a child. "I have always loved engineering. I was probably about nine years old when I first fell in love with the internal combustion engine. My parents always encouraged my interests by buying me books without deducting from my allowance. My father in particular introduced me to the radio and instilled a deep sense of fascination with transistors and wireless propagation," he says.

He was born in Tehran, Iran and moved to the United States when he was eleven. Niknejad says of his move, "I was young enough to easily integrate into American culture but old enough to have already planted deep roots into Iranian culture." He went to high school in San Diego, received his bachelor's degree from UCLA, then came Berkeley, "the best place on earth to do IC research."

It was his passion for research that brought Niknejad back to Berkeley after finishing his PhD in 2000 and working in industry for two years. "Academia is just the natural extension of being a graduate student," he says. "I loved being a grad student, so this seems only natural. I worked in industry for a couple of years and even though I enjoyed the experience, I quickly realized that a lot of industry work involves the 'last mile' or the details of implementing and delivering a solution. I'm more interested in the 'first mile,' or better yet, finding out which direction to go in the first place."

Niknejad has found challenges in his new position, and approaches them with the same probing point of view that he

Ali Niknejad

Organic Electronics Researcher Vivek Subramanian Joins Faculty

Vivek Subramanian co-founded Matrix Semiconductor, Inc., in 1998, the same year he received his PhD in electrical engineering from Stanford University. His PhD research was focused on developing high performance thin-film transistors for flat panel display and 3D chip applications.

He soon decided a faculty position might suit him better. "I worked at a large company for a few months, and decided that I didn't like the rigidity of the job," he says. "I worked at a startup for a while. The problem with successful startups is that they develop a 'large company' atmosphere. I enjoy the flexibility and dynamic nature of academia, so this was a natural choice for me." He first came to Berkeley as a visiting researcher in 1998.

Subramanian first became interested in electronics as a child, with the help of his parents. "I wanted to be an aero/astro engineer and spent all my allowance on model planes. My folks figured that there wasn't a great future in aero/astro, so they bought be an electronics kit for my birthday...the rest is history," he explains.

His research interests include advanced CMOS devices and technology and polysilicon thin film transistor technology for

Vivek Subramanian

displays and vertical integration applications. He is excited about the new developments in his area. "We are finally reaching a stage in technology which allows us to start thinking of 'system'-related issues," he says. "So far, we have been focused on materials and device problems. Through the innovative work of groups around the world, we are at a stage where we can start looking at applications. This is very exciting to me, and is definitely an area in which I plan to expand my effort. This is resulting in the growth of an organic electronics industry, though it is very much in a nascent form."

Subramanian's research group studies the physics and technology of organic semiconductors and their applications in displays, low-cost electronics, sensors, and actuators. They exploit the low-cost manufacturing properties of organic materials to produce disposable electronic circuits. They achieve the low cost by eliminating or reducing the use of lithography and/or vacuum processing. Another research group of his is studying the physics and technology of high-performance organic electronic and optoelectronic devices. They fabricate high-performance organic FETs and lasers, and study the properties of organic single-crystals and ordered thin films.

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uses in his research. "Teaching is a lot more work than I expected, especially teaching material for the first time," he says. "But the work has been very rewarding. I'm also impressed with the graduate students' capacity to learn. I'm throwing a lot of material at my students, but I don't see too much 'reflection.' Is the material being absorbed or is it going straight past them? I hope the former."

Regardless of the questions that his new role as teacher stir up, Niknejad has no such questions about his move back to Berkeley. "Berkeley is a very open and collaborative environment," he says. "I think that most of the interesting problems of today are at the intersections of various disciplines, so an environment like Berkeley's is critical for my research interests."

Both his move back to Berkeley and his transition to professor have been encouraged by his family. He explains, "My fiancée Alexandra has been very supportive of moving back to Berkeley; she was, in fact, *ecstatic* at the prospect of moving back. We both love Berkeley so much, so this is the ideal place for us to live." He continues, "Everyone in my family is very excited about my new position. They know this job suits me best."

Niknejad likes living in Berkeley

"Today Intel is proposing a microprocessor at 40 GHz and here at Berkeley we're working on a fully integrated wireless LAN system at 60 GHz in CMOS technology."

because of its diversity. Likewise, he appreciates the "international" aspect of his job, the way that science and engineering have always crossed cultural and language boundaries. He also sees exciting new developments in the future of his research area. He explains, "Traditional IC research has focused on integrating as much *electronic* functionality onto a single chip as possible. Today IC technology offers much more than transistors and resistors. We can also integrate more electronic functionality, such as inductors and transmission lines, electro-mechanical structures such as motors, hinges, resonators, and optical devices such as lasers and mirrors, and many other interesting structures onto a single die. What do you do with all of this functionality? While plenty of applications come to mind, we are faced with many new challenges in designing and simulating such hybrid systems."

As for his long-term research goals, Niknejad says, "I want to change the way people think about RF and microwave circuits. I envision a future where everywhere you see a microprocessor, you will also see a radio for wireless communication. Today RF and microwave circuits and systems are designed by world-class engineers with a background in high-

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UC Berkeley "Smart Dust" Set to Fight Terrorism

SAN FRANCISCO—"Smart dust," the increasingly tiny sensor modules comingout of a UC Berkeley science laboratory, may be going to war.

So far the minuscule devices that can sense temperature, motion and other things around them—then broadcast the data to a laptop computer somewhere—haven't actually been deployed in the war on terrorism.

But in a recent test, the snoopy little motes were dropped from a helicopter near a road in the Southern California desert, where they linked to a sub-miniature computer network and reported movement on the isolated road to a monitoring airplane, said Ruzena Bajcsy, director of the Center For Information Research in the Interest of Society.

Bajcsy made her remarks in an interview after a presentation about the center to the UC Regents on Wednesday. The center is one of five UC centers for science and innovation created two years ago by Gov. Gray Davis.

Larry Smarr, director of another center, the Institute for Telecommunications and Information Technology at UC San Diego, also spoke to the Regents.

The University of California, Berkeley, center is dedicated to exploring the frontiers of information technology, tackling the most critical needs in the emerging new world. It includes scientists and experts from UC Santa Cruz, UC Davis and eventually UC Merced.

Bajcsy told regents that since the Sept. 11 terrorist attacks, the center has expanded research to include homeland defense. Smart dust is high on the agenda.

There are many possibilities for use of smart dust modules related to the war on terrorism, Bajcsy said in an interview. They can be equipped with infrared heat sensors and deployed in buildings to sense whether anyone is inside.

"They can even tell if the people inside are living or dead," she said.

The modules are being built by UC Berkeley EECS Professor Kris Pister and researchers in his lab. He is a noted microrobotics researcher and when Davis created the center, Pister and his lab signed up for the project.

Pister dubbed the modules "smart dust" when they were still larger than a paper matchbox. That was two years ago.

The present modules are 10 cubic millimeters in size. One module neatly covers the date on a U.S. penny. But Pister's goal is to reduce them to about 1 millimeter.

At that scale, a single dust mote would fill the open space inside the "d" in the word "God" on a penny, Pister said.

One "Smart Dust" module neatly covers the date on a U.S. penny

He hopes to have such a module ready within a year.

Each of the current modules contains a light sensor, a digital converter, an optical transmitter and five different solar power supplies, he said. The next step is to produce modules with robotic legs so they can move on their own power, Pister said.

Besides the roadside test, the little modules have already shown their worth very dramatically, Bajcsy told the Regents.

In a test of the effect of a Northridge-size earthquake on an apartment building, simulated on UC Berkeley's earthquake shake platform, Cal Tech researchers

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UC Berkeley Students Compete in Programming Contest

In preparation for the 2001 ACM Pacific Northwest Regional Collegiate Programming Contest, EECS professor Paul Hilfinger hosted a semi-informal programming contest, open to any registered Berkeley undergraduate and to any registered Berkeley graduate student who had completed fewer than four semesters of graduate work and did not hold a graduate degree. In addition, no contestant could have competed in the ACM programming contest finals more than once.

Contestants received approximately eight programming problems to solve in five hours. Programs were to be written in Standard C/C++ using the gcc compiler or in Java using version 1.3 of the JDK. Contestants could not use pre-typed program text in electronic form, but were free to bring paper copies of anything. From the winners, Paul Hilfinger chose the following three teams to participate in the ACM programming contest: Berkeley Blue: Patrick Davidson, Mark Goodman, and Lior Abraham; Berkeley Red: Karl Chen, Rishi Kant, and Kevin Simler; and Berkeley Radicals: Alex Fabrikant, Yozo Hida, and Chris Wang.

This year's ACM Pacific Northwest Regional Collegiate Programming Contest was held November 10 at the DeVry Institute in Fremont. Each team had to solve eight real-life computer programming problems in less than five hours–from determining the shortest transportation routes available during road detours to calculating the value of each taxpayer's refund check, then pinpointing how much would be allotted each week. Teams were scored on the number of problems solved. For teams that tied on the number of problems, submission times (plus penalties for unsuccessful answer submissions) determined the winner.

At the end of the five-hour contest, known as the "Battle of the Brains," the top 10 teams of the 76 competing were:

1. Stanford Red: 7 problems, 1162 minutes
2. Berkeley Blue: 7 problems, 1328 minutes
3. Berkeley Gold: 5 problems, 850 minutes
4. Berkeley Radicals: 4 problems, 594 minutes
5. Stanford White: 4 problems, 676 minutes

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Intel Opens Berkeley Lab

"I want this to be seen as a piece of Intel being the model for research in the next millennium," said Pat Gelsinger, Intel Chief of Technology Officer.

Inside the Berkeley lab on Shattuck Ave.

Santa Clara-based chip giant Intel just opened a new research lab in Berkeley. EECS professor David Culler is the lab's director. The opening reception was held on Friday, November 9 and brought together College of Engineering Dean Richard Newton, Intel VP and Director of Research David Tennenhouse, Executive Vice Chancellor and Provost Paul Gray, and Intel Chief Technology Officer Pat Gelsinger.

The lab sits on the penthouse floor of a 13-story building on Shattuck Ave. in the heart of downtown Berkeley, just a block from campus. The lab is one of three that Intel now has near universities. The other two are next to the University of Washington in Seattle and Carnegie Mellon University in Pittsburgh. The labs will tackle long-term subjects and involve a variety of departments. Intel hopes to add at least three more labs to the mix, including at least one overseas.

"Lots of people have set up research labs next to universities, . . . and most of those labs don't really collaborate with the university, and sometimes they are competing with university researchers on similar projects," said David Tennenhouse. "We want these labs to actually do joint projects."

The focus of the Intel Berkeley lab is to invent, develop, explore, and analyze highly interconnected systems at the extremes of the computing and networking spectrum: the very large, the very small, and the very numerous. Extreme systems are likely to spur new kinds of applications, demand new technology, require novel design approaches, and present previously unseen phenomena. Opportunities arise not only from size and number, but because these systems are increasingly interconnected. Either on the scale of the societal infrastructure or schools of microscopic devices, they can orchestrate their activities and interact in complex ways.

Working closely with academic researchers, the Intel Berkeley lab performs leading-edge computer science on problems of scale, cutting across traditional areas of architecture, operating systems, networks, and languages to enable a wide range of explorations in ubiquitous computing, both embedded in the environment

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Berkeley Institute of Design

The Berkeley Institute of Design (BID) is a new interdisciplinary research and teaching center that includes engineering, anthropology, architecture, business, and art. EECS professor John Canny is the project's co-principal investigator (with Sara Beckman, senior lecturer at the Haas School of Business). Other professors involved in BID are James Landay and Carlo Séquin from EECS, Paul Wright from Mechanical Engineering, Ken Goldberg from Industrial Engineering and Operations Research and EECS, and Alonzo Addison from Center for Design Visualization and College of Environmental Design.

BID includes a teaching (MS and PhD degrees) and a research component. The design of the MS curriculum and BID's space (now in the Hearst mining building) is the first project. "It is a unique opportunity to co-design a studio-based curriculum and a digitally-enhanced, adaptive research/teaching space," says Canny.

The Berkeley Institute of Design (BID) is part of the Center for Information Technology Research in the Interest of Society (CITRIS) center.

BID is the component of CITRIS that unites disciplines from engineering to visual arts to realize the vision of CITRIS. BID begins with human-centered design practices such as contextual inquiry and participatory design. It emphasizes understanding the diversity of the consumer: gender, age, cultural and racial background. It is the closest point of contact between engineers and designers developing new technologies and social scientists doing needs analysis and evaluation of such technologies. BID intends to build on Berkeley's current state-of-the art technology with advances such as: tools for prototyping, visualizing and manipulating designs; the development of "digital critics" to automatically evaluate designs for manufacturability, complexity, and cost; understanding the entire product development process from design

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Jennifer Mankoff

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one point at Georgia Tech, she invented a soft keyboard that spared her wrists, using two computers and projected images of letters, which she circled with a pen.

Mankoff came back from her injury with a new direction for her research and a renewed determination in her field. She said, "my parents taught me the importance of making a difference in the world, something I thought I could do in this job." Of her decision to pursue an academic position, she says, "my advisors were great examples of a wonderful professor. And as an undergrad, the other computer science majors taught me a lot about teaching and the responsibility to pass knowledge onwards."

> *"I plan to continue to do work motivated by social problems and focusing in particular on disability and ubiquitous computing."*

Mankoff is certainly doing what she can to pass on what she knows, while continuing to give back to society, and integrates the two in her teaching style. She meets with students weekly as a group for "CoffeeTalk," in which they present relevant journal articles. Students in her *Assistive Technology* course must go through a disability-simulation exercise, and she expects students to volunteer one or two weekends of their time to work with the local disabled community. An important aspect of her role as professor is "teaching others the skills they will need to succeed." She feels encouraged by the "passionate, dedicated, and intelligent students" she works with.

She is happy to see a strong push towards research in social issues, across multiple disciplines, at Berkeley, as evidenced by the new CITRIS center. "I think social issues will continue to play a larger and larger role in computing. For example, privacy (a topic being investigated in collaboration with Anind Dey, Scott Lederer, and several other students and professors across campus) is beginning to permeate research in systems, social sciences, law, and human computer interaction."

Mankoff likes the blend of teaching, doing research, and teaching students to do research. She feels strongly about giving undergraduates research opportunities in her projects. "There are definitely too few opportunities for undergraduates," she says. "They were beating down my door for the nutrition project before it even officially existed."

She is enjoying the transition from student to mentor, although she jokes that it was strange to have "spent my whole life looking up to professors, and now I'm one of them." She says, "I love those moments when you're working with someone on a problem so tough you feel your head starting to hurt...and then you start to untie the knot and see the solution." As for Mankoff's future research goals, she says, "I plan to continue to do work motivated by social problems and focusing in particular on disability and ubiquitous computing." She is also "interested in helping to support increased inclusion of minorities and women at all levels of the program."

Mankoff still maintains various hobbies. In addition to painting, she plays an ergonomic viola, and enjoys traveling. "Art and music are both important forms of personal expression for me. I try to involve them in my work to some extent. Human computer interaction depends in part on aesthetics." Another research interest of hers is ambient displays, which "are about how you create something that has aesthetic value even to people who don't care about the data." An example is a picture of a wave that charts the ebb and flow of the Nasdaq Composite index designed by student Lisa Chan. On closer inspection, the wave is actually made up of text, listing individual stock prices.

She now types standing up, using a split keyboard that dangles off the edges of her desk so as not to strain her wrists, and only types two to three hours a day. Mankoff quickly became an advocate for spreading repetitive strain injury (RSI) awareness within the department. She started a lending library, where students and employees can borrow ergonomic equipment for a month at a time to explore the best setup for themselves, and maintains an email list for sharing information and concerns about RSI.

Mankoff's fiance, Anind Dey, also a graduate of Georgia Tech, is an adjunct professor in EECS and works full time at the new Intel-Berkeley lab. They did considerable research to find positions close to each other.

Not surprisingly, when asked how she likes her new position, Mankoff replied, "So far I have rarely had time to even reflect on my job. But when I do, I come up with many positives, ranging from the EECS department's support of my personal needs to its willingness to support students. Between the mentoring I have received and the wonderful collaborative opportunities that have arisen, I have felt Berkeley to be a supportive and rich environment." ⌘

SRC Supports EECS Research

Berkeley

EECS was the big winner in year-end funding from the Semiconductor Research Corporation (SRC), the chip industry's long-term research consortium. Of the $6.8 million the SRC disbursed in university research contracts in fourth quarter 2001, Berkeley took home $1.6 million. EECS Prof. William Oldham was awarded the largest chunk, $1.1 million, to pursue his advanced lithography research networks.

Other Berkeley EECS recipients of SRC semiconductor research grants were professor and Microfabrication Laboratory director Tsu-Jae King, who received $300,000 and Prof. Ernest Kuh, who received $100,000.

Vivek Subramanian

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Subramanian says, "My group's organic electronics focus is definitely an engineering/economics problem. We try to keep economic impacts in mind while we do scientific/engineering research. I like this aspect of our work, since it makes it more practical, in many respects."

He sees room for growth in his research, and looks forward to broadening the focus of his group. "Currently, my research is very materials and device-centric," he says. "I would like to straddle the system and circuit issues a little as well. I think it will make my research group more dynamic if we understand the applications of our technology, besides purely focusing on the technology on its own."

Vivek Subrmanian with his electric car

A vegan and advocate of alternative transportation solutions, he seems well-suited to the Berkeley atmosphere, and has found campus to be a nice fit. "I was already at Berkeley as a visiting researcher, and knew that I liked the environment," he says. "The collaborative spirit on campus is unique, in my opinion, which works to the benefit of new faculty. Plus, I didn't really want to leave the Bay Area." Subramanian lives in Orinda with his wife, 10-month old son, three dogs, and two cats. His wife also works on campus, as a principal editor in the College of Chemistry. The close proximity of their offices allows them to see each other quite a bit during the day. He says, "I try to devote as much time as possible to my family, and academic life is good in that sense, since I can adjust my schedule fairly easily."

Subramanian seems happy to be settled, after having lived in many parts of the world. He says, "I grew up all over the place, since my family traveled a lot. I was born in Calcutta, India, but spent several years of my life in Bombay, India; Buffalo, New York; Baton Rouge, Louisiana; Bangkok, Thailand; and Jakarta, Indonesia."

Subramanian is quickly settling into the academic environment here. "I'm already enjoying the flexibility and collegiality. I really enjoy the collaborative spirit on campus, and hope I can expand that even further as my research scope expands with time," he explains. He has no regrets about his move to academia, or to UC Berkeley, and says "I really enjoy teaching. Berkeley undergrads are outstanding. They work hard, and are generally pretty motivated. In particular, I have enjoyed teaching EE130, since the students who take this course are generally specifically interested in the material (as opposed to taking it as a requirement to graduate)."

He looks forward to changes he sees on the horizon in his research area. "Currently, people focus too much on the device and material issues, and don't try to approach things from a system perspective," he explains. "I think people will start approaching things in a top-down manner, and this will change both the people involved in organic electronic research, as well as the way research is conducted."

He fills his spare time with family, hobbies, alternative transportation advocacy, and animal rights. "I've always been an animal lover," he says. "Over time, my views hardened, primarily through exposure to the reality of the meat and dairy industries in the US. For a long time, I was a nonvegetarian, but the contradiction in my lifestyle got to me, and I became a vegan. When I had more time, I used to participate in animal welfare activities, though I haven't had much time lately. This is one of the things I hope to fix in the future."

Subramanian drives an electric car, a teal 2000 Corbin Sparrow. "As a graduate student, I took a course on energy processes. The course opened my eyes to electric vehicles, fuel cells, etc. I bought an electric vehicle two years ago, and have been a convert ever since," he explains. "I've worked with other EV owners to spread the word through public information sessions, rally meetings, etc." Subramanian's electric vehicle has a maximum speed of 75 mph and a range of 30-50 miles/charge.

In addition to hobbies of playing touch football and squash, he is also an avid gardener and cook. He's currently in the midst of a multi-year horticultural experiment to cultivate ultra-hot peppers.

As for the juggling act between research, teaching, and the daily duties that come with an academic position, Subramanian says, "Balancing everything going on in my workweek is a challenge... my inbox is often 3-4 weeks out of date. I don't have a strong preference between teaching and research. I like them both, and they complement each other. Research makes me a better teacher, by keeping me up to date. Teaching makes me a better researcher by training me to ask the right questions." ⌘

Ali Niknejad

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frequency circuits, systems, and device physics. While we will continue to train many more of these dynamic engineers in the years to come, I also want to make it easier and less time-consuming to design such circuits. If radios are going to be as ubiquitous as microprocessors, we have to make them a lot more programmable and flexible in adapting to new environments."

He likes taking a multidisciplinary approach to his work. His PhD research was a mix of circuits, devices, and electromagnetics. He sees the trend continuing. "In particular, electromagnetics is playing an increasingly important role in today's circuits and systems. In the past several years, people have ignored electromagnetics when designing circuits, since the frequencies were sufficiently low so that lumped circuit approximations worked well. Today Intel is proposing a microprocessor at 40 GHz and here at Berkeley we're working on a fully integrated wireless LAN system at 60 GHz in CMOS technology. Clearly, we can't ignore electromagnetic effects when designing such systems," he explains.

Niknejad has always loved computers and programming and in college he had a lot of difficulty choosing between engineering, computer science, physics, and math. He feels choosing electrical engineering was the right compromise, as there is so much overlap with these other fields. ⌘

Valerie Taylor Wins Habermann Award

Valerie Taylor, who received her PhD in EECS here at Berkeley in 1991, is the 2002 recipient of the Computer Research Association's A. Nico Habermann Award. The award is given to "an individual who has played a leadership role in aiding members of under-represented groups within the research community."

Taylor is a computer science professor at Northwestern University. Her research interests include performance of parallel scientific applications, computer architecture, and visual supercomputing environments.

The award honors the late A. Nico Habermann, who headed NSF's Computer and Information Science and Engineering Directorate until his death, and was previously chair of the School of Computer Science at Carnegie Mellon. Much of his career was dedicated to mentoring women and minority graduate students. He was deeply committed to increasing the participation of women and underrepresented minorities in computing research.

Valerie Taylor

CRA makes the award, usually annually, to a person who has made an outstanding contribution to aiding members of underrepresented groups within the computing research community. This award recognizes work in areas of government affairs, educational programs, professional societies, public awareness and leadership that has a major impact on advancing these groups in the computing research community.

EECS academic coordinator of the Center for Undergraduate Matters, Sheila Humphreys, received the Habermann Award in 1999 in recognition for the "twenty years she has worked as a mentor and advocate for students from under-represented groups in computer science and engineering." EECS professor Eugene Lawler received the 1995 Habermann Award posthumously "for the outstanding contributions he made to promote the entry of female, minority, disadvantaged and disabled students into graduate research programs in computer science at the University of California at Berkeley."

National Semiconductor

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on waiting a semester to take EECS 150, so that he will be among the first to use the new lab. His response to the completely reconstructed facility: "This place just gets more and more wired. I feel so provileged."

In addition to a pulse generator, mixed-signal oscilloscope, and other diagnostic equipment at every station, each Dell desktop has a video camera, microphone, and speakers hooked into a multimedia local area network. All workstations have audio and video connections to the instructor's station, enabling instructors to hear and see students when they ask questions. The class can watch a multichannel demonstration of the answer on pull-down screens around the room, or on their own computers, by way of a whiteboard camera, an instrument camera, and a link to the instructor's high-resolution screen.

Shankar Sastry, EECS chair, said, "The new space offers students a dramatic improvement in class quality, increasing technical capability and academic engagement with the material. It is truly a showcase lab and has achieved–in one corner of the building–the kind of enhanced environment we hope to see throughout Cory and its classrooms in the next few years.

Lab in Cory before the remodel

Special thanks are due to Ron Fearing for his leadership and to staff members Scott McNally and Ferenc Kovac who proved instrumental in the design, instrumentation and implementation of this lab."

Before the ribbon cutting ceremony on February 20th, EECS professors Ron Fearing, John Wawrzynek, Robert Meyer, and Shankar Sastry presented their plans for the lab to 20 National Semiconductor attendees, including CEO Brian Halla, who had nurtured the project.

Halla spoke at the ribbon cutting, further emphasizing National Semiconductor's commitment to students. Executive Vice Chancellor and Provost Paul Gray and Dean Richard Newton also spoke, conveying the campus and College of Engineering's gratitude. The lab idea was initiated by Paul Gray when he was dean of engineering. Shankar Sastry pointed out that Ron Fearing, Scott McNally, and Ferenc Kovac's dedication led to the lab being completed both under budget and ahead of schedule. Following the ceremony, Halla gave a talk titled "The Sight and Sound of Information–Defining the Future Beyond the PC." A reception in his honor followed Halla's talk.

National Semiconductor has also established a distinguished professorship to accompany the new lab. Robert Meyer, whose book *Analysis and Design of Analog Integrated Circuits* is now in its fourth edition, is the beneficiary. ⌘

Kevin Kornegay Wins Black Engineer of the Year Award

Kevin Kornegay, an EECS alum who received his PhD in 1992, and currently a professor at Cornell University, is the 2002 recipient of Black Engineer of the Year Award in the category of Promotion of Higher Education. The award is given annually to an educator who either sets new standards of excellence in teaching or opens the way to better access to higher education for minorities. The selectee may be a professor, an administrator, or an organizer of initiatives to promote better funding and industry support for African-American undergraduate and graduate students. The Black Engineer of the Year Awards Ceremony was held Saturday, February 16th in Baltimore.

Kevin Kornegay

"Folks don't really know about–or aren't aware of–the people in the sciences, and there are many, many gifted African-American scientists who have made significant contributions to society, whose inventions and innovations just go unnoticed."

The award is sponsored by Career Communications Group, publisher of "US Black Engineer and Information Technology," the Council of Engineering Deans of Historically Black Colleges and Universities, Lockheed Martin, and Daimler Chrysler.

When asked to define success, Kornegay replied: "Success to me is to meet and exceed one's personal and professional goals and aspirations." His advice for students is "if you want to be an engineer, focus on mathematics and physics."

Kornegay was a double-major in math and pre-medicine as an undergraduate at Pratt Institute. When he began an internship at AT&T Bell Laboratories in Murray Hill, NJ, he worked on computer-aided design software used for computer-chip layouts. He found mentors there who pushed him to pursue graduate degrees in electrical engineering and computer science. "Bell Laboratories was unique in that regard because they had, at the time, probably the largest collection of black scientists, who were my mentors," he recalls. "Just being a part of that helped me to realize how far I could go." Kornegay received both his master's and PhD in EECS at Berkeley, with Prof. Broderson.

Kornegay's research interests include high temperature electronics, smart power electronics, VLSI design, wireless MEMS for harsh environments, and wide bandgap semiconductors devices. Prof. Kornegay is the recipient of the National Science Foundation CAREER grant, the General Motors Faculty Fellowship, and the National Semiconductor Faculty Development awards. He is a member of the Eta Kappa Nu, Tau Beta Pi, and a senior member of the IEEE.

Kornegay directs the Advanced Integrated Microsystems Research Group and the Cornell Broadband Communications Research Laboratory and serves as faculty advisor to an interdisciplinary student team developing autonomous underwater vehicles.

Despite a long list of awards from prestigious corporations, foundations, and science organizations, Kornegay says this award means a great deal to him, because it comes from his peers, and also because it shines a light on black scientists in a country where images of blacks are more commonly featured in athletics or the entertainment world.

"Folks don't really know about—or aren't aware of—the people in the sciences, and there are many, many gifted African-American scientists who have made significant contributions to society, whose inventions and innovations just go unnoticed," he said. ⌘

Intel Lab

cont. from pg. 5

or carried easily on moving objects and people.

Intel hopes that the open collaboration with Berkeley will break down barriers between the academic and corporate worlds and could speed product development.

"I want this to be seen as a piece of Intel being the model for research in the next millennium," Pat Gelsinger said.

The applications range from monitoring the environment to detecting cracks in a building to enjoying entertainment, said Culler, who is on a one-year leave of absence to start up the lab. "There's tremendous potential," he said.

"This is a great place to work," said Hakim Weatherspoon, a third-year graduate student in computer science and president of the Black Graduate Engineering and Science Students. "It's very easy to collaborate with other students, researchers, and professors."

Intel and the universities will work out issues of intellectual property and ownership of potential patents before each project gets off the ground, said Culler. "The whole idea is to tackle research together . . . and harness the (resources of the) two organizations together," he said.

The Berkeley lab will house 40 to 50 researchers, half from Intel and half from the university. More information on the new Intel Research Lab at Berkeley can be found on the website: http://www.intel-research.net/berkeley/index.htm. ⌘

Virtual Development Center

Berkeley has joined forces with the Institute for Women and Technology (IWT) in a new project to foster research and involve students in developing technology designed by women specifically to serve the interests of women and families.

EECS students involved with the Virtual Development Center

Created in September 1999, IWT's Virtual Development Center (VDC) is "an industry supported partnership of universities and communities aimed at bringing women's genius to the technology of the future."

The VDC creates a framework in which non-technical women from many communities join with female university students and faculty and female computer scientists and engineers in industry in the design and creation of useful new technologies. IWT hopes to transform engineering education so that more women from broad populations pursue technical careers. In doing so, they want to train future computer scientists and engineers to routinely bring broad human perspectives and involvement to their projects. IWT wants to generate projects that build technology that is inspired by and wanted by women.

The EECS department, in cooperation with the Center for Information Technology Research in the Interest of Society (CITRIS) and the Berkeley Institute of Design (a new interdisciplinary research and teaching center that includes engineering, anthropology, architecture, business, and art) was selected by IWT to initiate a Virtual Development Center (VDC) site for undergraduate and graduate students. CITRIS will apply state-of-the-art information technology to tackle and solve some of today's most crucial societal problems, including energy, health care, education, transportation, and the environment.

The VDC program is a collaborative network of eight geographically distributed university development centers, where design prototypes are developed based on input from women and families who are underrepresented in technology development. The VDC sites are supported by a $4 million equipment grant from the Hewlett-Packard Corporation.

Shankar Sastry, EECS chair, commented that "with computational devices being ubiquitously embedded in the environment around us, the interface design and usability are increasingly critical—hence, the synergy between and among the Virtual Development Center, CITRIS, and the Berkeley Institute for Design."

EECS professor John Canny is the Berkeley Institute of Design's co-principal investigator (with Sara Beckman, senior lecturer at the Haas School of Business). He feels that "an important method of understanding users' needs is through participatory design. The VDC will give us an opportunity to give students hands-on experience with the process."

Studies point out that framing computer science in its social context and involving women students early in applications are effective methods for retaining women in engineering. "Some of the projects in my undergraduate *User Interface Design, Prototyping, and Evaluation* course (CS 160), will look at designing appropriate computer technology for women with disabilities," says EECS professor James Landay. "This is an experiment in conjunction with the Virtual Development Center." Students will be using "contextual inquiry methods" to gain information directly from disabled women in Berkeley, a community renowned for its pioneering work in access for the disabled, concerning the products they feel would assist them. Landay's new class is the campus's first course collaboration with the center. Student projects focus on designing appropriate computer technology for women with disabilities.

On January 26th, an "innovation workshop" at Soda Hall brought together students, faculty, staff and members of the disabled community. Their goal was to generate ideas for the Virtual Development Center. Some of the ideas they came up with: an allergy sensor that could detect potentially harmful ingredients, such as peanuts or dairy; a jacket with self-adjusting temperature control; an SUW, or sports-utility wheelchair, that could drive over sandy beaches or rough mountain terrain; PDAs (such as Palm Pilots) with voice recognition; cookware with a "food-doneness" indicator; hands-free ATM machines; a one-handed jar opener; a hand-held device that would translate audio to text for the hearing-impaired; and a machine that makes the bed. Students from Landay's class were required to write a two-page essay on one of the project ideas. Class member Jenny Nguyen said of the workshop: "I see my normal routine in a whole new perspective. It's really changed the way I think about things."

The women participants in the workshop had a variety of disabilities, said Maureen Fitzgerald, director of the local non-profit group Computer Technologies Program, who recruited the community participants. "There are women here who are blind, deaf, have mobility impairment and cognitive disabilities," she said. "They have helped students have an expanded sense of what it's like to have disabilities. I think it's blowing their minds."

Technology developed for the disabled can help everyone, said Landay. "Engineering is all about how to design something given certain constraints." ⌘

Maria Klawe Is Regents' Lecturer

Distinguished computer scientist and mathematician Maria Klawe visited EECS for a week in April as a Regents' Lecturer, one of the most prestigious honors in the University of California system.

Currently the dean of science at the University of British Columbia, Klawe founded the Discrete Mathematics Group at IBM's Almaden Research Center. Klawe is the vice-president of the Association for Computing Machinery and a trustee of the Palo Alto-based Institute for Women and Technology. She also holds the NSERC-IBM Chair for Women in Science and Engineering, one of five regional chairs across Canada. She has also served on many boards and advisory councils, including the board of trustees of the American Mathematical Society, the Computing Research Association, and the BC Premier's Advisory Council on Science and Technology. Klawe is a fellow of the Association of Computing Machinery, and received the Vancouver YWCA Women of Distinction Award in Science and Technology.

Klawe has made significant research contributions in several areas of mathematics and computer science including functional analysis, discrete mathematics, theoretical computer science, and interactive-multimedia for mathematics education. She is working on a landmark study of how gender differences influence career choices in science and technology among teens. She recently won the Canadian New Media Awards "New Media Educator of the Year" award. Klawe emphasizes increasing the participation of women in information technology careers.

During her visit, Klawe met both formally and informally with faculty and students, including sitting in on EECS classes, holding office hours for students, delivering her Regents' Lecture: "The Impact of Technology on Education: Beneficial, Disruptive, or Merely Distracting?" on April 10, lunching with female EECS graduate students, and attending the EECS faculty sherry hour.

The abstract for her Regents' Lecture reads: Over the last two decades many "educational technology gurus" have predicted "the end of education as we know it" as a result of the learning opportunities offered by the web and other computer-based approaches. This talk explores how computing and communication technologies are impacting education at the K-12 and post-secondary level, and presents the speaker's perspective on the key opportunities and challenges for effective use of educational technologies. ⌘

Berkeley Women's Panel at Grace Hopper Conference

EECS grad student Judy Liebman's submission was accepted for presentation at the Grace Hopper Celebration of Women in Computing Conference in Vancouver, British Columbia, Canada in October 2002.

The conference, chaired by Valerie Taylor, who received her PhD in EECS here at Berkeley, was designed to bring the research and career interests of women in computing to the forefront. Judy Liebman will moderate a panel at the "Birds-of-a-Feather" session, which was designed to bring together participants with a common interest in technical areas.

Judy will present a panel of women grad students from Berkeley, discussing "The Woman Graduate Student's Perspective." She is currently compounding a list of questions from all of the women who will sit on the panel. The questions touch on what each of them thinks is important to find out or important to answer, and will hopefully lead to a general discussion of what this group of EECS graduate students find encouraging or discouraging about the department and field.

Judy is in the helicopter UAV group working under Shankar Sastry. Her current project is the development of a hardware-in-the-loop simulator for the helicopters. This project also involves redesigning the embedded software for the helicopters. Judy is president of WICSE, the EECS graduate women's organization.

Judy's response to being accepted to the conference: "It is a great opportunity for us not only to attend such a conference, but also to discuss with each other more formally the issues about graduate school that we will present in the panel."

The conference is hosted by The Institute for Women and Technology (IWT). IWT's mission—to increase the impact of women on all aspects of technology and to increase the positive impact of technology on the lives of the world's women—is carried out through the Grace Hopper Celebration of Women in Computing conference, systers online community, Senior Women's Summit, and the Virtual Design Center (VDC). Berkeley is also one of the eight VDC sites.

More information on the conference is available at: www.gracehopper.org.

Smart Dust

cont. from pg. 4

brought a truckload of equipment with miles of wiring and sensors to measure the mock quake intensity and damage. The sensors cost $8,000 each.

Using "smart dust" technology, a graduate student obtained the same results. "She used a laptop, a drill and the sensors. Total cost: $70 per sensor. Identical data was collected at an incredible savings," Bajcsy said.

—William Brand
Oakland Tribune Online
March 14, 2002

Programming Contest

cont. from pg. 4

6. Univ. British Columbia 1: 4 problems, 832 minutes
7. Univ. British Columbia 0: 4 problems, 931 minutes
8. Davis Beta: 4 problems, 1010 minutes
9. Trinity Western 1: 3 problems, 556 minutes
10. Univ. of Oregon: 3 problems, 580 minutes.

The Stanford Red and Berkeley Blue teams qualified to go to Honolulu for the world finals.

EECS associate chair Christos Papadimitriou said of Berkeley's success, "This is great news, and another fantastic performance by our genius coders/thinkers and their coach. Congratulations!"

"The competition is important because people who excel at sports have more opportunities to exhibit to the world," Berkeley Blue team member Lior Abraham told the *San Jose Mercury News*, "This gives programmers a chance to compete in our own contest."

The international programming competition began in 1970 at Texas A&M University, and quickly gained popularity in the United States and Canada as a way to promote the development of top students in the emerging field of computer science. The competition has been headquartered at Baylor University in Texas since the 1980s.

In the last international contest, held in March in Vancouver, Berkeley's team placed 29th in a field of 64. Berkeley won the international contest in 1996, and placed second in 1995.

The ACM International Collegiate Programming Contest was held in Honolulu, HI March 20-24. The problems included computing how much food to purchase for a trip across the desert on foot, how best to connect a group of small islands to the largest with a high-speed Internet cable, and how to calculate the distance traveled by the center of a bicycle wheel that encounters both horizontal and vertical surfaces. Sponsor IBM estimates that these problems are "equivalent to completing a semester's worth of computer programming in one afternoon."

The Berkeley team (Lior Abraham, Patrick Davidson, and Mark Goodman, coached by Paul Hilfinger) received honorable mention, with Shanghai JiaoTong University receiving first place. Awards for the competition include prizes and $10,000 scholarships.

"It really emphasizes how much programming talent there is outside the US," said Hilfinger. "The time for complacency is over. The questions have gotten more challenging, and the competition stronger. We're going to have to devote more time to preparation than we've done in the past." ⌘

Berkeley Institute of Design

cont. from pg. 5

to manufacture to market; and collaboration tools for team design across disciplinary boundaries and physical distance.

Some current concerns of BID include:

Design practice: contextual inquiry and participatory design are established ways of actively involving the user in design. But they are subjective and lack verifiability. Computational tools could allow for quantitative verification of qualitative theories in areas such as web and user interface design. There is great opportunity for new approaches that incorporate the best features of both approaches. Various "brainstorming" techniques have been developed that facilitate the creative phase of design, and these methods have been studied extensively at Berkeley. This work suggests new approaches for fostering the creative process using a mixture of practice and computer tools.

Design tools: there is a broad range of design tool research including tools for the early stages of design, informal prototyping, wizard-of-Oz techniques, rapid functional prototyping, immersive design environments, and late-stage design tools. The latter would include digital critics with knowledge about manufacturability, cost, availability of parts, etc. While these tools are generally specific to a discipline, there are many features of design (e.g., support for informal design in the early stages and the value of visualization) that are universal and would greatly benefit from comparison and contrast between disciplines.

Visualization tools: visualization supports design in many ways. Designers can see and manipulate the design itself in many ways, from different perspectives that expose aspects of the design, and use analysis tools for particular tasks such as calculating heat and stress (in mechanical design), natural and artificial light (in a building), or user traffic (for a web site). Designers may also want to view an entire design space, i.e., a representation of many possible designs, and to evaluate characteristics of those designs in a single view. These tasks pose many interesting and challenging research problems.

Collaboration tools: design is almost always a team endeavor, and most teams span several disciplines. Tools already developed at Berkeley allow search of design databases with discipline-specific vocabularies, allowing designers from one discipline to more accurately locate material written by others. More work is needed on this. Work is also needed on group tasks such as coordination and scheduling, annotation, and ad-hoc conferencing.

Evaluation tools: in today's dynamic marketplace, design is often an evolutionary task. Well-designed products must be evaluated several times during design, and also later in the field to discover actual and new usage patterns. New techniques can automate some of this analysis and reduce the labor overhead for continuous design refinement during a product's lifecycle. Products in the future may include data-gathering facilities for evaluation in the product itself.

Canny reflects on the inspiration behind BID: "As the world around us is being reshaped by information technology, we witness the evolution of the built environment into the interactive environment, whose design requires a new kind of designer. The challenge is to design complex behaviors for artifacts, and to integrate them into systems that provide a coherent experience for the individual." ⌘

Peter Elias, 73, Noted Theorist of Information and Computers, Dies

Peter Elias, a theorist in the field of information and computer science, died on December 7 at his home in Cambridge, MA. He was 78.

The cause was Creutzfeldt-Jakob disease, a nervous system disorder, according to the Massachusetts Institute of Technology, where he was a senior lecturer and Edwin Webster professor emeritus of electrical engineering.

Elias worked in the department of electrical engineering and computer science and at MIT's Research Laboratory of Electronics. He focused on information theories and how they might solve practical questions in communications, data processing, and computation.

He was a pioneer in developing practical methods for communicating information as data coded in ones and zeros. Such digital communications, which were first proposed by Claude Shannon in 1948, are at the heart of computer-driven telecommunications networks.

Elias's coding systems compressed the digital data so that complete messages could be transmitted rapidly. He also invented ways of catching and correcting errors that could creep into the communications when the streams of ones and zeros were interrupted. His methods were used to gather information from satellites sent to other planets and are the basis of codes used today to transmit data over cell phones.

Peter Elias was born in New Brunswick, NJ, the son of an engineer at the Thomas A. Edison laboratory. He graduated from MIT in business engineering and management. After service as a radio technician instructor in the Navy, he went to Harvard and received master's degrees in science and engineering in 1948 and 1949, and a PhD in applied science in 1950.

He worked at Harvard until 1953, when he joined the MIT faculty, rising to full professor in 1960. That year he became the youngest man to head the electrical engineering and computer science departments.

Peter Elias

He was named Webster professor in 1974 and took emeritus status in 1992. He also held visiting professorships at Harvard, the Imperial College of Science and Technology in London, and here at UC Berkeley.

Elias was a past member of the President's Science Advisory Committee's panel on computers in higher education and a member of the American Association for the Advancement of Science, the American Academy of Arts and Sciences, and the National Academy of Sciences. At his death he remained an editor of Information and Computation, a journal he helped establish in 1957 under its original name, *Information and Control*.

Elias is survived by two sons, Daniel, of Lincoln, MA, and Paul, of Cambridge; a daughter, Ellen Elias-Bursac, also of Cambridge; a sister, Barbara Elias of New York and Chilmark, MA; and six grandchildren. His wife, Marjorie Forbes Elias, died in 1993 after 43 years of marriage.

EECS associate chair Christos Papadimitrious responded to the sad news, saying Peter Elias was a "great information theorist, and also co-discovered the max-flow/min-cut theorem. He was a very clever and kind man."

Alberto Sangiovanni-Vincentelli

cont. from pg. 1

advisory board of the Center for Western European Study, chief technology adviser of Cadence Design Systems and is head of Cadence's European Laboratories.

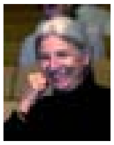
"Alberto Sangiovanni-Vincentelli is truly the Renaissance man of our industry, having had a profound and multi-dimensional impact on the science of electronics," said Ray Bingham, EDA Consortium chairman and Cadence Design Systems CEO. "As an entrepreneur, he helped spawn electronic design as a global industry. As an educator, he's mentored, influenced and inspired generations of engineers who shape the electronic design industry. As an inventor, he has developed industry-setting advances in technology that have improved the quality and reduced the design time of integrated circuits and electronic systems. And as a visionary, he's spearheaded collaborative projects between customers and vendors around the world."

Initiated in 1994, The Kaufman Award honors individuals who have made a substantial, sustainable contribution to the success and advancement of the electronic design industry. Sangiovanni-Vincentelli's involvement with the design industry dates to the mid 1970s. His major contributions to electronic design include:

- Contributed to the algorithmic foundations of the circuit simulator SPICE and developed with his students a new class of circuit simulators based on novel algorithms such as Relax and Spectre.
- Co-developed with EECS professor Robert Brayton the field of logic synthesis with a set of programs, such as Espresso and MIS, and algorithms that are the foundations of several industrial offerings in the field of hardware synthesis.
- Conceived and created the Cadence Berkeley Labs whose focus is dedicated to technical innovation in the area of design science, including but not limited to advanced EDA technology and methodologies.
- Established and now runs the Cadence European Labs (CEL), which taps into the research activities at several European universities and research centers

cont. on pg. 15

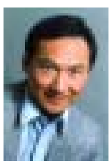
Faculty Awards and Honors



Ruzena Bajcsy, CITRIS director and EECS adjunct professor, received the 2001 ACM/AAAI Allen Newell award. The citation reads: “For outstanding research contributions in several areas including computational anatomy, and active sensing and perception, resulting in major impacts in computer graphics, virtual reality, computer vision and artificial intelligence.”

Jim Demmel was elected as fellow of the IEEE. Demmel was recognized for his “contributions to the field of computational mathematics and the development of mathematical software.”

Laurent El Ghaoui and **Ion Stoica** were awarded Okawa Foundation Research Grants in Information Technology. These awards come with a $10,000 research grant. The awards are named after Isao Okawa, the Japanese industrialist and philanthropist who founded Sega Corporation.

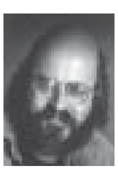


Chenming Hu (on leave from the EECS department as chief technology officer for the Taiwan Semiconductor Manufacturing Company), shared the 2002 Solid-State Circuits Award from the Institute of Electrical and Electronics Engineers with former EECS professor Ping-Keung Ko. The award honored their joint development of device models used for integrated circuit design.

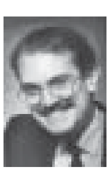
Robert Meyer was awarded the first National Semiconductor Distinguished Professorship.

George Necula was awarded the 2001 ACM Grace Murray Hopper Award, “for his seminal work on the concept and implementation of Proof Carrying Code, which has had a great impact on the field of programming languages and compilers and has given a new direction to applications of theorem proving to program correctness, such as safety of mobile code and component-based software.”

Andy Neureuther received the Distinguished Alumni Award from the University of Illinois at Urbana-Champaign, where he received his bachelor’s, master’s, and PhD degrees. Andy was “honored for his outstanding technical and management contributions to the development of microwave tubes and microwave amplifiers. A leader in photolithography research and integrated process technology simulation, he is best known for his pioneering work in computer-aided modeling of semiconductor processing.”



Christos Papadimitriou was elected to the National Academy of Engineering “for contributions to complexity theory, database theory, and combinatorial optimization.” In addition, Christos was elected as fellow of the ACM. The citation read: “For outstandingly novel and fundamental contributions to computer science and especially to complexity theory, database theory, and combinatorial optimization.” Christos was also the winner of the Donald E. Knuth Prize, awarded every 18 months by the ACM Special Interest Group on Algorithms and Computing Theory and the IEEE Technical Committee on the Mathematical Foundations of Computing. He was selected for his “long-standing and seminal contributions to the foundations of computer science.”



Alberto Sangiovanni-Vincentelli received the 2001 Phil Kaufman Award, which honors individuals who have made a substantial, sustainable contribution to the success and advancement of the electronic design industry.


Alan Smith and **Elwyn Berlekamp** have been elected fellows by the American Association for the Advancement in Science. Each year the council elects members whose “efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished.”

Ion Stoica was awarded the 2001 ACM Dissertation Award “for his dissertation, ‘Stateless Core: A Scalable Approach for Quality of Service,’ nominated by Carnegie Mellon University.”

Pravin Varaiya won the IEEE Field Award in the Control Systems Society for 2002, called the Control Heritage Award. The citation cites his contributions to “stochastic control and differential games” and applications to “intelligent transportation systems.”

David Wagner received one of the two honorable mentions for the 2001 ACM Dissertation Award, for his dissertation, “Static Analysis and Computer Security.”

Avideh Zakhor was elected as IEEE fellow for her “contributions to image and video compression.”

Alberto Sangiovanni-Vincentelli

cont. from pg. 13

in Italy, France, Portugal, and Spain.

- Spearheaded efforts on the automatic synthesis of embedded software, platform-based design, architecture-function co-design and communication-based design.
- Developed, with his students and co-workers, the POLIS system, the first tool to use a self-consistent, well defined globally asynchronous locally synchronous (GALS) paradigm for system-level design and to include software synthesis, formal verification, performance evaluation and simulation in the overall design methodology.
- Working with Cadence and its customers, developed the Cadence Virtual Component Co-design (VCC), a design environment that enables teams to collaborate on challenging designs, thereby boosting productivity and reducing cycle time. VCC has subsequently earned EDN Magazine’s 2000 “Innovation of the Year” award, Electronic Products “Product of the Year” award and French Groupe Tests Publication’s “Electron D’ Or” as best EDA product of 2000.
- Helped create and directs PARADES (Project on Advanced Research on Architecture and Design of Embedded Systems), a collaborative effort supported by Cadence, Magneti-Marelli and ST Microelectronics in Rome. PARADES specializes in automotive electronics.

Stanford University’s Giovanni De Micheli, who nominated Sangiovanni-Vincentelli for the Kaufman Award, said, “Alberto is a researcher and an educator who has shaped the EDA industry landscape. As a researcher he has pioneered several new design technologies, most recently the VCC design environment. As an educator, he has inspired and mentored a generation of academics and engineers, most significantly by transmitting to them enthusiasm and knowledge.”

“I have had the distinct honor and pleasure of working with Alberto for almost a quarter century now. His boundless energy, his unbridled enthusiasm, and his creativity and passion have enabled Alberto to lead many breakthrough developments in EDA–in his university research and his industrial affiliations–both criteria central to the Kaufman Award,” said Richard Newton, dean of the College of Engineering.

According to the EDA Consortium: “Where electronics begins” best describes the electronics design automation (EDA) industry. The EDA Consortium represents this vital industry on a worldwide scale. It is the international association of companies developing design tools and services that enable engineers to create the world’s electronic products. EDA provides the critical technology to design electronics that enable the information age, including: communications, computers, space technology, medical and industrial equipment and consumer electronics. As stated recently by the Nobel Prize Committee, “The integrated circuit is the basis for all modern technology.” ⌘

Collaborations with Stanford

The second annual Stanford-Berkeley Computer Science Day was held on Saturday, February 23rd at Stanford University. The theme for this year's event was the cross-fertilization between the two departments. It featured technical talks by graduates of both schools as well as posters from current graduate students.

Both Armando Fox, who received his PhD at Berkeley and is now a professor at Stanford, and Stuart Russell, who received his PhD at Stanford and is now a Berkeley professor, spoke at the event.

A topic of another talk given was the concept of Stanford/Berkeley joint courses. One such class was *Recovery-Oriented Computing*, offered in fall 2001, and taught by Armando Fox and Berkeley's David Patterson. Classes alternated between the two campuses, and a bus was provided to take students back and forth.

A class-commissioned retrospective on the course lists the benefits students and professors found. One was the "different perspectives, not only from different faculty, but from different students in the courses. The different projects on the two campuses affects the students perspectives."

Another was the "variety of speakers. Some were willing to go to one campus but not the other, for geographic reasons. Also, the potential of 'capturing' speakers who were going to be on either campus for other reasons." One of the lectures, David Patterson's "How to Have a Bad Career in Research/Academia" talk (which can be found at http://www.cs.berkeley.edu/~pattrsn/talks/nontech.html), was given at Berkeley but webcast to students at Stanford. It is possible that in the future the lectures may all be attended through "telepresence," making commuting unnecessary, although course organizers emphasize that webcasting cannot replace the value of in-person class meetings. ⌘

Poster session at Stanford

Berkeley EECS students and professors waiting for the bus home from Stanford

Student Awards

Five EECS students have been named to the Siebel Scholars Class of 2002: **Tim Callahan**, **Allison Coates**, **David Liu**, **Jacob Lorch**, and **Miriam Walker**. Siebel Scholars, selected based on merit and leadership, will receive $25,000 to defray tuition costs and expenses for their second year of graduate studies.

EECS graduating senior **Alexander Fabrikant** was a runner-up for the Computing Research Association's Outstanding Undergraduate Award. **Brian Gaeke** and **Emily Chung,** a graduating senior in the EECS honors program, both won honorable mention.

EECS graduate student **Qiang Lu** has been selected for the 2002 Ross Tucker Award, in honor of his research on silicon integrated-circuit device technologies, including the use and characterization of new materials for silicon VLSI applications, novel processing techniques, device physics, and dielectric reliability.

EECS Students Attend Tapia Conference

Sarah Boaz, a senior undergraduate in EECS, attended ACM's Richard Tapia Celebration of Diversity in Computing Conference in Houston, TX last October. She felt the conference "was an invaluable experience and extremely inspiring to me."

Sarah applied for and received a travel grant from NSF to attend, with a departmental recommendation from EECS. "We consider Sarah's selection for this conference to be an honor for her and for UC Berkeley," said Sheila Humphreys of EECS Undergraduate Affairs.

Hakim Weatherspoon and Greg Lawrence, both CS graduate students here, also attended. Hakim is president of Black Graduate Engineering and Science Students Association (BGESS).

Sarah was involved in Double X, an after school girls' science club for grades 9-12 at Thurgood Marshall High School in San Francisco and Oakland Technical High School in Oakland. UC Berkeley volunteers plan and run a science or engineering mini-lesson. Sarah's lesson was on "How to Make an Electric Motor."

Sarah found the panels she attended, about various aspects of graduate school, to be informative and interesting. They covered topics such as balancing graduate school and family and the importance of support groups. She felt reassured to find a group of women who were dealing with the same issues she was. Sarah found the banquet, when she heard several people speak on how Richard Tapia had positively influenced their lives, "the most inspiring, and most entertaining, part of the event." She felt Tapia's "benevolence was well stated when they read off of his very long and impressive resume: right next to election to the National Academy of Engineering was teaching science to a kindergarten class. If I could accomplish even 10% of all he's done in his lifetime (so far) I would be very satisfied. Higher education seems like just the first step of many."

The program chair of the conference is Berkeley PhD alumna, Valerie Taylor, professor of CS at Northwestern University. The program was funded by NSF and CRA. The website for the conference is www.sdsc.edu/Tapia2001. ⌘

Staff Award

Hua-Pei Chen, director of Instructional and Research Information Systems here in EECS, received the Chancellor's Outstanding Staff Award, in recognition of her many accomplishments and contributions to our department.

The initiative behind nominating Pei for this award came from her staff, in a clear sign of their appreciation for her achievements.

EECS Students Win Google Awards

The winners of Google's 2002 Scholarship competition have been announced, and three Berkeley EECS students received honors.

Google states that "this year's recipients met a number of rigorous requirements, including being on track to graduate with a GPA of 3.80 or above in computer science or computer engineering/software engineering by June 2002. Google also considered exceptional teaching skills and outstanding achievements, such as significant contributions to the open source community."

The third place winner was Alex Fabrikant, one of our CS undergraduates, and the only undergraduate to receive a cash award. He was "honored for his research on degree distributions in a class of random graphs." Alex will receive $5,000 and Google will send an equal amount to the department.

Berkeley EECS undergraduates Alan Shieh and Jana van Greunen also received two of the honorable mentions that were awarded.

Google commented that "all of this year's winners combine academic excellence with research and educational relevance in ways that contribute to the advancement of knowledge in the computing field. Google is pleased to be able to recognize their achievements."

ERL memoranda

The following reports are recent publications of the UC Berkeley Electronics Research Laboratory. Copies may be ordered from Jeff Wilkinson, ERL Publications, 253 Cory Hall, UC Berkeley, Berkeley, CA 94720-1774. Prices are indicated. You may order up to six reports at one time. For each order, please include $5.00 to cover postage and handling. Send a check or money order in US currency payable to the Regents of the University of California. Information can also be found at: *http://www.eecs.berkeley.edu/~erl/publication.html.*

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M01/32: P. Pakzad and V. Anantharam, *A New Look at the Generalized Distributive Law,* June 2001, $3.10.

M01/33: S. A. Edwards and E. A. Lee, *The Semantics and Execution of a Synchronous Block-Diagram Language,* October 2001, $2.60.

M01/34: S. S. Pradhan, J. Chou, and K. Ramchandran, *Duality between Source Coding and Channel Coding with Side Information,* December 2001, $3.50.

M01/35: Y. Jiang and R. K. Brayton, *Don't Care Computation in Minimizing Extended Finite State Machines with Presburger Arithmetic,* December 2001, $1.00.

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M01/40: J. Wang, *Equipment and Process Modeling and Diagnostics in Semiconductor Manufacturing,* December 2001, $19.10.

M01/41: J. Liu, *Responsible Frameworks for Heterogeneous Modeling and Design of Embedded Systems,* December 2001, $17.70.

M01/42: K. Adam, *Domain Decomposition Methods for the Electromagnetic Simulation of Scattering from Three-Dimensional Structures with Applications in Lithography,* December 2001, $19.60.

M02/1: M. Cheng, *Comprehensive Model for Projection Photolithography: Rigorous, Fast, and Novel Processing,* January 2002, $18.60.

M02/2: R. Vidal, S. Soatto, and S. S. Sastry, *Two-View Segmentation of Dynamic Scenes from the Multibody Fundamental Matrix,* February 2002, $1.10.

M02/3: R. Vidal, S. Soatto, and S. S. Sastry, *A Factorization Method for 3D Multi-Body Motion Estimation and Segmentation,* February 2002, $1.40.

M02/4: B. Wu, *Coulomb Interactions in High Throughput Electron Beam Lithography,* February 2002, $13.60.

M02/5: L. Wernli, *Design and Implementation of a Code Generator for the Cal Actor Language,* March 2002, $7.20.

CS publications

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CSD-02-1175: D. Patterson, A. Brown, P. Broadwell, G. Candea, M. Chen, J. Cutler, P. Enriquez, A. Fox, E. Kiciman, M. Merzbacher, D. Oppenheimer, N. Sastry, W. Tetzlaff, J. Traupman, and N. Treuhaft, *Recovery Oriented Computing (ROC): Motivation, Definition, Techniques, and Case Studies,* March 2002, $6.00.

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Congratulations Janie!

Janie Ellison, Senior Editor in EECS, who wrote and edited numerous EECS department publications (including this newsletter) for 9 years, retired on January 4th. We wish her well in all her future endeavors and we'll miss her.