

# UW EE CURRENTS

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*This Newsletter appears monthly. Please send any suggestions or comments to the editor, Veronica Young, at [veronica@ee.washington.edu](mailto:veronica@ee.washington.edu)*

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## Dan Dailey's Smart Trek Featured Coast to Coast

Dan Dailey and his intelligent transportation systems work related to the Federal DOT Model Deployment Initiative in Seattle has been getting a lot of press attention recently. Besides a recent article in the New York Times, the project has also been covered in the Seattle PI, KCPQ TV, KIRO Radio, KING TV, ABCNews.Com, Northwest Cable News and World News Radio Network. When Dailey was asked to comment on what made the media focus on the project's Seattle component, he said, "The media found the words I spoke regarding Smart Trek to be the most quotable".



*EE Research Assoc. Prof. Dan Dailey*

The U.S. Department of Transportation chose four cities for Smart Trek, a technological experiment in improving traffic flow: Seattle, Phoenix, San Antonio, and New York. This has resulted locally in an \$18 million program which uses the Washington State Department of Transportation resources to establish transportation information networks around the Puget Sound. Smart Trek utilizes over 300 cameras and the thousands of sensors dispersed by WSDOT throughout major commuter routes. The data gathered is used in traffic efficiency projects, such as Traffic TV, a broadcast aired on UW's cable access Channel 75. This program is one of the combined efforts between WSDOT and the UW College

of Engineering Intelligent Transportation System. The long term impact of such information could be a large cut in the proposed \$34 billion estimated for road improvements in Washington by 2020, perhaps by as much as 1/3 of the projected cost.

## Rock & Roll Radar Explores the Aurora

At the Manastash Ridge Observatory, atop a 3,400-foot-high hillside south of Ellensburg, Electrical Engineering professor John Sahr and his team are using rock music signals and off-the-shelf computer parts to build an economical radar that could someday unravel the secrets of the aurora, improve communications and save lives.



*EE Associate Prof. John Sahr and grad student Frank Kind gaze into the night at the Manastash Ridge Observatory.*

Conventional radars detect and locate radio waves emitted from a radar station. The waves are reflected by an object and returned to a receiving station, which analyzes them to pinpoint the object. The Manastash Ridge radar uses "passive" FM radio waves already scattered in the air by Seattle hard-rock station KISW.

Constant and chaotic, the station's signal is the best kind for the aurora-chasing radar. The signal contains random,

"never repeat" properties that distinguish it from other sound waves the radar detects. Sahr said it would have been difficult to raise the money to buy the land and build and operate a FM radar station to study the northern lights. Also, the Federal Communications Commission would be loath to allow a transmitter that would probably interfere with radio broadcasts, he said.

Besides, with research funding on a steady decline in the past decade, Sahr wanted to find a way to shrink the cost and size of technology used by scientists to study the atmosphere. "So we're exploiting someone else's signal," he said. "We preserve the spectrum, but we can still do science."

The system makes use of two radio receivers, one in Seattle at the University of Washington and another atop Manastash Ridge. Both are tuned to 99.9 megahertz, KISW's spot on the FM dial. The Seattle receiver makes an accurate recording of the station's signal, while the ridge receiver catches the very weak signals that scatter over the Cascades. As the charged gases in the upper atmosphere begin moving and creating light, they create sound waves much like those detected when a tornado's vortex expands and contracts. Thanks to the Doppler effect, the radar can measure the velocity and distance of the noise as the FM radio signals "echo" back to the observatory. In the 18 months since the radar antenna began receiving signals, Sahr and his team have bounced rock music off airplanes, Mount Rainier and even the hot-gas trails of falling meteors.

With the sun building to the peak of its 11-year sunspot cycle, it's imperative that scientists begin finding cost-effective ways to predict the effects of solar storms, said Dawn Gidner, the

University of Washington electrical engineering graduate student who designed the antenna. Gidner said passive radar technology also could provide a cheap way forecast weather and tell people in the Lower 48 when the northern lights are coming their way. The stealth-like nature of the radar might be appealing to the military, she said. "I don't know why someone has done this before. Maybe they haven't thought of it. John's a pretty brilliant guy who's always coming up with cool ideas."

The National Science Foundation agrees. Four years ago, the federal foundation bestowed its prestigious Young Investigator Award upon Sahr and has awarded the project more than \$100,000 in grant money. "This is totally revolutionary science," said Shunandu Basu, the foundation's program director for upper-atmosphere physics and chemistry. "It's more bang for the tax buck and something that benefits society. And it's showing promise."

## IGARSS'98 A Big Success

The IEEE International Geoscience and Remote Sensing Symposium (IGARSS'98) was held at the Seattle Sheraton from July 6-10, 1998. The Symposium was hosted by the University of Washington and sponsored by the IEEE Geoscience and Remote Sensing Society. EE Professor Leung Tsang was General Chairman and Professors Yasuo Kuga and Dale Winebrenner were Technical Program Co-Chairs. The theme was "Sensing and Managing the Environment", emphasizing the important role of remote sensing in monitoring global climate change and natural and man-

made hazards and in managing natural resources. A record attendance was set with over 1000 attendees presenting more than 1200 oral and interactive papers. Delegates came from over 40 countries with more than 40% of the delegates coming from outside of North America. The Dean of the College of Engineering, Professor Denice Denton, gave the welcome address at the Plenary Session. The Awards Banquet was held at the Bell Harbor International Conference Center. The honored speaker at the banquet was Dr. Joseph Bordogna, IEEE President and Acting Director of the National Science Foundation. Professor Akira Ishimaru received the 1998 IEEE GRSS Distinguished Achievement.

*The annual conference soccer match between the delegates of North America and the delegates of the Rest-of-the-World took place at the University of Washington soccer field. The North America team defeated the Rest-of-the-World team by a score of 4 to 2.*

## EE Department Logo Contest

Electrical Engineering is hosting a contest for design of a department logo. The winning designer will be awarded a \$100 University Bookstore gift certificate.

Entries should be submitted in electronic format (via 72 dpi gif) to [veronic@ee.washington.edu](mailto:veronic@ee.washington.edu) or in paper format to

Veronica Young,  
Box 352500, Room 253C.  
The deadline for entries is December 1<sup>st</sup>.

Entries will be posted on the department web site for viewing, comments, etc. The EE Operating committee will be the subjective and arbitrary final judge in the contest. Contestants agree to allow the department unlimited use of their artwork..

## Our Mission

*(message from the Chair)*

**Howard J. Chizeck,**  
**chizeck@ee.washington.edu**

Our mission is to become one of the very top EE departments in the United States, through the delivery of outstanding and innovative education and the conduct of cutting edge research. We will:

- Provide our students with an outstanding education
- Perform cutting edge research in electrical engineering, having national and international technical influence.

Translating these words into deeds will require the efforts and creativity of all members of the department, and an ongoing process of continuous improvement.

On September 23 the faculty and staff met for an all day “retreat” on the Skansonia ferry boat. This event was designed to help us to better achieve our mission. I would like to take this opportunity to thank all of the faculty and staff for their participation in this event in sunny Seattle. In this issue of *the EE Currents*, both Associate Chairs present summaries of their presentations at this meeting. As you can see from their comments, we have a number of exciting and important tasks before us.

A key step in the accomplishment of the department’s missions is the careful recruitment of outstanding new faculty. We seek to hire the very best candidates. On the last page of this newsletter is an announcement of our faculty search. I encourage all of our friends to help us in the search process, by distributing this advertisement and by nominating potential candidates for these positions.

## New Faculty

*(ed. note: the following was inadvertently not included in last month’s story about our five other new faculty)*

**Dr. Sumit Roy** joined the EE Department as Associate Professor in January of 1998. He received his Ph.D. in Electrical Engineering and his M.A. in Statistics from the University of California, Santa Barbara in 1988. He also completed a M.S. in Electrical Engineering at UCSB, after earning a bachelors degree from the Indian Institute of Technology, Kanpur.



*EE Associate Prof. Sumit Roy*

Prior to joining the University of Washington, Dr. Roy was an associate professor at the University of Texas-San Antonio. Roy’s area of expertise is in the field of communications, particularly in the area of physical layer, multiple access technologies, and networking. His major impact has been in the area of statistical signal processing as it applies to communication. He has made significant contributions in the field of transmitter/receiver optimization. He has begun a very significant effort in the optimization of wireless networks

through integration of the network layers. He will teach courses in modulation and coding, adaptive antennas, multi-user receivers, and wireless networks for multimedia.

### \*\*\*Kudos\*\*\*

***These EE graduate students have recently passed their qualifying exams:***

George Bennett

Bradford Gillespie

Ju-Hwan Jung

Ming Liu

## EE Faculty Notes:

**Sinclair Yee** was granted a patent for “Surface Plasmon Resonance Light Pipe Sensing Probe and Related Interface Optics.”

**Ming-Ting Sun** was awarded a patent on “Group-Of-Block Based Video Signal Combining for Multipoint Continuous Presence Video Conferencing”. **Sun** was also named a member of the Steering Committee of Technical Program, SPIE ’99 Visual Communications and Image Processing.

**Karl Bohringer** is co-author of the paper presented in plenary session of the SPIE Symposium on Micro-machinery and Microfabrication, a major 1998 MEMS conference on the West Coast. **Bohringer’s** Ph.D. thesis has been nominated by Cornell University for the ACM Doctoral Dissertation Award.

### ***A Warm Welcome to the Newest Member of the EE Team:***

**Victor Moore**, Computer Group



## Best Wishes To:

\***Lara Braithwaite**, on her engagement and move to Hawaii.

\***John Sahr and Eliza Sutton**, on the birth of son, John Issac.

\***Ernesto and Regan Cains**, on the birth of son, Armando Luis

## Corporate & Professional Advisory Board Looks To The Future

Electrical Engineering's Corporate and Professional Advisory Board (CPAB) consists of a select group of representatives from industry and professional associations who can be called upon by the department to act as a sounding board on academic issues and general trends in electrical engineering education and research.

Currently CPAB has eight members

- John Brock, TRW
- James Cavoretto, Fluke Corporation
- Stan Kaveckis, Tektronix Inc.
- Bill Prather, Andersen Consulting
- Charles Orrestad, Physio Control
- Charlie Potter, Hewlett Packard
- Soren Vestergaard, Supra Products
- Loren Bosshard, Intel.

CPAB had its fall meeting on September 2<sup>nd</sup>. EE Chair Howard Chizeck introduced himself to the group and gave a report on the status of the department. Associate Chairs Les Atlas (Research) and Mohamed El-Sharkawi (Academics & Curriculum) each gave a presentation. Chizeck remarked that he would like to expand CPAB to twelve members in the near future, with 2/3 of the membership from local industry. He is seeking recommendations of

individuals for this committee; suggestions may be sent to him at [chizeck@ee.washington.edu](mailto:chizeck@ee.washington.edu)

## EE Students Perform Whale Acoustic Studies

Some graduate students truly suffer during their research. Others go sailing off the coast of Norway during the summer, and then in the Caribbean during the winter.



Sperm Whale diving off of Norway

The synergy between engineering between engineering and other disciplines of research is emphasized in the Electrical Engineering department's sperm whale acoustic research.

Begun in 1997 by Michael Dougherty, the group, which included Ethan Aruntunian, David Mattes, and Joel Reiter) visited Norway during the spring and summer of 1998 to perform data analysis, equipment design and construction, and fieldwork. While this trip offered an excellent opportunity to study bachelor male sperm whales, the females and calves do not migrate that far north. Now the researchers have headed to the island of Dominica in the Caribbean Sea, to study the female-calf groups.

The research focuses on two tasks: acoustic recognition of individual

whales and passive acoustic tracking of whales. Both are crucial investigative techniques for establishing baseline data on the whales' behavior and assessing impacts of antropogenic noise from sources as shipping, seismic surveys, and naval operations. Acoustic tracking and individual recognition are beyond the technical reach of most whale biologists; as such, the heavy involvement of engineers in this effort offers the potential to make significant original contributions to marine mammal science.

The group received invaluable guidance and advice from Professor John Sahr and Bruce Darling, as well as Les Atlas, who has been the signal processing supervisor and faculty advisor for Michael Dougherty, and has contributed his lab resources towards the purchase of needed equipment. The project is currently applying for a Royalty Research Fund award, with Atlas as Principal Investigator. The EE department has also contributed financial support to this project.

### Chair's Open Office Hours

- Staff Tuesday 10-11 am
- Faculty Thursday 3-4 pm
- Students Friday 1-2 pm

**Drop In! Room 253A**

## EE Espresso Open For Business - Help Us Choose An "EE" Name

Caffeine, fruits, and scones are now available for those hungry EE/CSE building inhabitants, thanks to the opening of the EE Espresso bar on the first floor (west side). Items may be purchased to satisfy your eating and/or drinking pleasure between 7:30am-3:00pm. Stop by to meet

Lissa Lambright and Rich McKay, the cheerful folks who work the booth.

A contest is being held to give the espresso bar a name, reflective of the academic environment housing it. Prizes include a Seattle's Best Coffee gift basket, espresso bar coupon book and more. Entry forms are available at the espresso bar and in the Electrical Engineering Administrative office at the front desk or sending your idea via e-mail to [veronica@ee.washington.edu](mailto:veronica@ee.washington.edu). Entry deadline is Thursday, October 29<sup>th</sup> and the winning name will be announced at the EE Halloween party on Friday, October 30<sup>th</sup>.

## Building a Top National EE Research Community

*Prof. Les Atlas*

*Associate Chair for Research  
([atlas@ee.washington.edu](mailto:atlas@ee.washington.edu))*

*"Reform: A thing that mostly satisfies reformers opposed to reformation." —*

*Ambrose Bierce, The Devil's Dictionary.*

This article is an expansion of the presentation I made at the faculty retreat on September 23, 1998. The purpose of this article is to spell out our unifying goal of national leadership, to discuss some specific ways to move toward this goal, and to focus, with more detail, on three specific concerns.

### The Role of Associate Chair for Research

This Associate Chair position, which is a new position in our department, is perhaps best summarized as a "facilitator of technical influence." Our main role as electrical engineering faculty is to provide technical education and leadership for our students and

research community. While our department is the regional leader in electrical engineering, there is consensus among our faculty, staff, and students that national and international leadership is where we should set our sights. In order to pursue this competitive goal, we will need to focus as a cohesive unit on the directions below. The main role of the Associate Chair for Research will be to facilitate cooperation and provide assistance in these directions:

**Publicity.** There are often groundbreaking results of our research or successes in our industrial collaborations which could be publicized better. Some reasons for this are the humility of Principal Investigators, lack of time or resources to publicize, and difficulty of presenting detailed technical results to a more general audience.

**Industrial Relations.** We are fortunate to have a strong local industry base. Our relations with local industry have traditionally been good, but with the recent strong growth in our area, we should be able to cooperatively achieve and foster the same kind of national leadership that our industry partners have. Often, expanding this cooperation simply means getting individuals in our department together with their potential collaborators in industry and, in other cases, an improved model of technology transfer is needed to improve the technical influence and competitiveness of existing collaborations with industry. Our field is moving so fast that past views of technology transfer, with the notion of faculty being given problems, going off to work on them for one to three years, and then returning with a solution, are outdated. Instead, close interactions and collaborative

partnerships with industry are a much better fit to the drifting needs of the market.

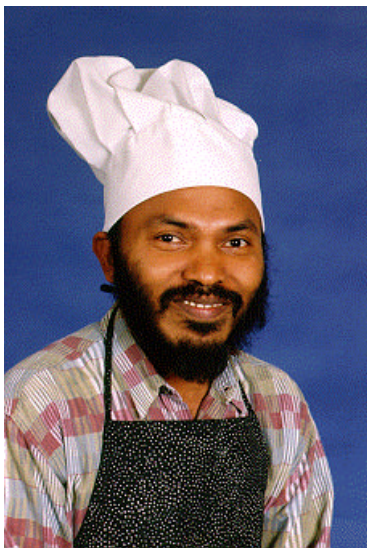
**Government Relations.** Our department has done well with individual or small group projects with government. But we could be doing better with large-scale programs such as Engineering Research Centers (National Science Foundation) and Multi-University Research Initiatives (Department of Defense). These larger programs increase our visibility and offer a potentially longer-term and more efficient method of research. We could also leverage our regional industrial strength in ways which are encouraged by government, for example, via the under-subscribed GOALI program run by the National Science Foundation. (For more information see: [www.nsf.gov/goali](http://www.nsf.gov/goali))

**Internal Relations.** In order to meet some of the challenges above, the faculty must have opportunities and encouragement to extend their collaborations. As we form into research groups, it may be beneficial to explore a larger range of interactions, both within and outside our department. Our department should also enhance opportunities for faculty to interact technically in meaningful ways. We hope that creative alignments into research groups will be happening through this quarter and the Chair and I will work closely with research groups to assist on the issues above. I will also push for expanding opportunities for faculty to interact and learn more about each others' research.

## Mani Soma Returns to Teach EE, Folk Dancing

Professor Mani Soma has returned to Electrical Engineering, following a one-year sabbatical. After time away from teaching, Soma is anxious to instruct students in Circuit Theory (EE233), VLSI Testing (EE540), and Folk Dancing.

Yes, folk dancing! Every Thursday, from 12:15-1:00pm in the EE/CSE 2<sup>nd</sup> floor atrium, folk dancing classes are taught by Soma, who also serves as Associate Dean for Organizational Infrastructure in the College of Engineering and Lynn Girardeau, an academic counselor in civil engineering.



EE Professor Mani Soma

Soma started folk dancing as a graduate student at Stanford in 1975. He has found it to be a great way to meet a wide cross-section of people while having fun and listening to good music. Folk dance clubs publish directories so you can dance in locations around the world. In fact, it was through folk dancing that Soma met his wife, Karen, in Schenectady, New York. "She's not

an EE or engineering type," quips Soma. "She's normal."

Soma has wanted to hold this class for years but was unable to, due to the lack of indoor space large enough for dancing. With the opening of the new building, Soma's hopes are now realized.

"You don't need to have a Ph.D. to turn out. If you have two feet, you're set!" remarks Soma. He suggests wearing comfortable shoes on those dancing feet and dressing in comfortable clothing for ease in movement. Professor Soma hopes faculty, staff, and students will all take part in this activity. "In dancing everybody's the same, regardless of education or job title."

## ABET 2000, Course Consolidation Top Priorities

**M. A. El-Sharkawi**

*Associate Chair for Academics & Curriculum*

*e-mail: elsharkawi@ee.washington.edu*

*(ed. note: ABET is the Accreditation Board for Engineering and Technology.)*

As you might have noticed, we are all going to be very busy this year. We have a new chair with tons of ideas, dreams and hopes. We are also getting close to our next ABET visit, and we are consolidating our courses.

The requirements of the new ABET 2000 are unlike any other in the past. ABET is no longer interested in rules, criterion and numbers, but rather in quality and creativity. The new criterion allow school to provide engineering education with emphasis on their areas of strength. This way, not all school are measured by the same yardstick.

ABET 2000 is interested in several professional aspects that are not

associated with core engineering education. Besides the ability to apply knowledge of math, science, and engineering, our students are required to have several other skills. Among them are the ability to function on multi-disciplinary teams, understand professional and ethical responsibility, and understand the impact of engineering solutions in a global and societal context.

These changes are due to the government, industry leaders and educators calling on ABET to lessen its preoccupation with quantitative criteria. In 1994, ABET, NSF and various industries established ABET 2000. ABET 2000 criteria was approved by ABET Board of Directors on November, 1996.

ABET 2000 allows institutions and programs to define their own mission and objectives so as to meet the needs of their constituencies. ABET 2000 is based on the principles of continuous improvement, input of constituencies, process focus, outcome and assessment linked to objectives, a systematic pursuit of excellence, and satisfaction of the needs of constituencies

I know that some of us may see this as a watered-down engineering education. But if we do it right, we will not dilute any of our engineering material, but rather focus the general elective options, that are currently required from all of our students.

The other task for this year is to consolidate our courses. By doing so, we can achieve more focused and cohesive topics, enhance our TA support, encourage faculty to develop new labs and enhance the quality of material and education delivery, improve class enrollments, and facilitate student mentoring. The consolidation



and the self-evaluation for ABET must go concurrently.

The undergraduate and graduate studies committee and their chairs (James Ritcey and Robert Marks), will be very busy working with Howard and I on the above issues. They will need help and support from all of us. The current target is to have the plan for ABET and consolidation ready for next years' implementation.

If you have any thought on these topics, or you wish to discuss them further with Howard or I, please do not hesitate to do so. We need all the ideas, help and support we can get!

## Sunny Weather Helps Make EE Annual Retreat A Shining Success

The Skansonia ferry boat was the setting for the Electrical Engineering department retreat this year. Held on September 23<sup>rd</sup>, this year's retreat included staff as well as faculty.



*EE Staff members sport sunglasses while sitting on the Skansonia's deck at the EE Annual Retreat*

Upon arriving on the boat, EE department members enjoyed visiting over a buffet breakfast on the deck of the Skansonia. Faculty and staff then headed indoors to listen as EE Chair

Howard Chizeck spoke about organizational changes, faculty recruitment and hiring, new initiatives, the restructuring and strategic planning processes, and presented an update on the new building and space issues. Les Atlas, Associate Chair for Research, and Mohamed El-Sharkawi, Associate Chair for Academics & Curriculum, also made presentations on the activities they will be focusing on during the year. Dean Denice Denton also addressed the group, as did representatives from the College of Engineering Diversity Programs: MSEP (Minority Science and Engineering Program), MESA (Mathematics, Engineering, Science Achievement Program), WISE(Center for Women In Science and Engineering), and Do-It (Disabilities, Opportunities, Internetworking and Technology Program).

After lunch staff and faculty separated for the rest of the day. Staff heard from Gene Hooyman, regarding the EE restructuring process and

Jan Reha from Career Discovery who spoke on “The Changing World of Work”. Faculty discussed committee structure membership, faculty meetings schedule, research and curriculum groups, the new ombudsman committee, and kicked off the department’s new strategic planning process.

Response to the event has been very positive, particularly from staff, who were included in the retreat for the first time. The day provided an opportunity for all members of EE to hear the Chair's vision for the future.



*EE Professors Howard Chizeck, Richard Christie, and Bob Albrecht (back) enjoy a break during Skansonia retreat*



*Seattle and Lake Union provided a peaceful background for this time of reflection on E's vision for change.*

## ***Faculty Positions Department of Electrical Engineering UNIVERSITY OF WASHINGTON***

The Department of Electrical Engineering seeks seven new tenure-track faculty in all areas of electrical engineering, with particular interest in hybrid and mixed signal devices; analog and digital circuit design; embedded systems; telecommunications, wireless and network systems; VLSI, MEMS and microfabrication; image and signal processing; multimedia devices; electromagnetics and optics; power systems, energy systems, power electronics, power system economics, and renewable energy; automation and control; robotics; intelligent systems; and actuators, sensors, and devices.

The Department, College of Engineering, and the University of Washington are committed to outstanding teaching. Successful applicants will be expected to provide innovative and quality teaching that integrates research with instruction. They will be expected to teach both undergraduate and graduate courses within the Department and to engage in interdisciplinary research. Appointments can begin in September or December 1999. Although the Department is seeking individual(s) at the assistant professor rank, under unusual circumstances and commensurate with the qualifications of the individual(s), an appointment may be made at the rank of associate professor or professor. Applicants must have earned a doctorate by the date of appointment.

UW currently has the highest level of federal funding of all public universities. The EE department currently has 39 faculty (growing to 46), 400 undergraduates, and over 200 graduate students. Information about the department is available at <http://www.ee.washington.edu>.

Send resume, list of publications, statement of interests and goals, and the names and addresses of at least five references to EE Faculty Search Committee, Department of Electrical Engineering, Box 352500, University of Washington, Seattle, WA 98195-2500.

Applications will be accepted until March 1, 1999, or until the positions are filled. The University of Washington is building a culturally diverse faculty and strongly encourages applications from female and minority candidates. The University is an Equal Opportunity, Affirmative Action Employer.

### **Department Ombudsmen Chosen**

The faculty and staff of the EE department have selected the following individuals for this service, by secret ballot:

- Mark Damborg
- John Sahr
- Helene Obradovich
- Autumn Blanchard

*Congratulations to all four for being  
deserving of this high honor.*

### **This Month's Events**

**October 23 and every Friday  
during Fall Quarter  
EE/CSE Atrium  
EE Social Hour**

This is a great opportunity to talk with EE faculty, staff, and students in an informal setting.

**October 27 10:30am-Noon,  
EE/CSE Room 403  
EE500V Seminar**  
Speaker: B.F. Hobbs, The John  
Hopkins University

**October 30  
3:00pm, EE/CSE Atrium  
EE Halloween Party**  
Faculty, staff & students are invited to bring families to this holiday event. EE Grad students will hold a pumpkin carving contest, there will be trick-or-treating and face painting in the atrium, as well as other activities. Costumes are strongly encouraged!!

**November 3  
2:30-3:30pm, EE/CSE Room 003  
EE Faculty Meeting**  
This is a very important meeting for faculty to attend, as several faculty appointment cases will be presented for vote.