

UW EE CURRENTS

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Professor Ishimaru wins the John Howard Dellinger Gold Medal

Dr. Akira Ishimaru was recently awarded the John Howard Dellinger Gold Medal from the Union Radio-Scientifique Internationale. The goal of the URSI is to stimulate and to coordinate, on an international basis, studies in the field of radio, telecommunication and electronic sciences. The medals are awarded every three years to outstanding scientists whose achievements have been particularly valuable.



Professor Ishimaru's award was accompanied by the following citation, "For contributions to the theories and applications of wave propagation and scattering in random media and backscattering enhancement."

Congratulations Professor Ishimaru!



Engineering Writing Center

*EE Students Gain Valuable Skills While
Working as Peer Tutors in the Engineering
Writing Center*

Last year, four Electrical Engineering students became better writers, better mentors, and better communicators by working as peer tutors in the Engineering Writing Center (EWC). They also helped dozens of other engineering students complete writing assignments in their majors.

Phil Defigh, Melany Hunt, David Clemmons, and Joanne Hughes were chosen for peer tutor positions because of recommendations from their advisor or from their technical writing instructors. Peer tutors in the EWC meet with other engineering students in 45-minute appointments. They don't "fix" student papers; rather, they help their peers become better writers by listening, asking the right questions, and modeling effective editing strategies. As Melany Hunt commented about her experience in the EWC: "The center's approach as a tool for the writer and not a proofreading service is the key to its success. . . . It is the student who must understand why or how to change anything on the paper. This approach helps the student become a better writer."

(continued)

Students often don't have any resources for help with writing assignments in their technical classes. They may feel uncomfortable with asking their professor for help with writing. Melanie reflected that "the center offers the students an opportunity for a meaningful response to their work. . .it offers students an opportunity to find help when help is not otherwise available."

Peer tutors expect to be helping others with their writing. An unexpected benefit for most tutors, though, is how much the experience helped them. Nearly all tutors comment that helping others with their writing has made them a better writer. As Phil Defigh noted, "I learned that it is easy to tell someone something, but very difficult to help them understand it. I've noticed that in order to help someone understand something, you need to understand it twice as well yourself." What a great lesson for these students to take with them to their first job!

David Clemmons, who talked about his experience at the EWC in a presentation at the spring quarter engineering faculty meeting, emphasized the value of learning how to mentor other engineers, a skill not really taught in traditional engineering courses. Because of his tutoring experience, he felt better prepared to begin his job in technical marketing with Intel.

The Engineering Writing Center opened in autumn of 1997, with support from Dean Denice Denton. It is directed by Carolyn Plumb, from the Department of Technical Communication, and is open about 20 hours each week to help engineering students with their writing. In addition, Dr. Plumb consults with engineering faculty in regard to designing and evaluating engineering writing assignments.

Scholarship Awards

Every year the EE department conducts a scholarship process for undergraduate students. Students can apply for money from the departmental scholarship fund as well as scholarship money allocated by the College of Engineering. These awards support both

continuing and incoming students and are awarded on a competitive basis, with academic merit being the primary factor.

Last spring, nine students were awarded scholarships from the College of Engineering:



Conan Viernes
Stephen Juranich
Ryan Apperson
Anahita Zarei
Michael Warren
Bao-Tran Nguyen
John-Rolf Oakley
Christopher Mattson
Jason Rubadue

The Department was also pleased to award scholarships to the following five students:

Jason Rubadue
George Change
Henny Lim
Hung Huynh
Duc Pham



Congratulations to these outstanding students for their academic achievements and best wishes for their continuing success.

Andersen Consulting & the Capstone Award

Last June Kristopher Daves was the winner of this first Andersen Consulting Capstone Award. Kristopher won \$1,000 for his Poster titled Measurement of Dielectric Constant Using Waveguide Technique.

Andersen Consulting has generously offered to support this yearly award, to be presented each spring, that acknowledges excellence in the Undergraduate students in the EE department.

(continued)

Andersen Consulting is a strong supporter of higher education on a worldwide scale. Sponsoring the EE Capstone Design Project provides an opportunity to support higher education on a more personal level by developing relationships with the department, faculty, and individual students.

EE Poster Day

The EE Poster Day was held on the same day as the first Corporate Advisory Board Meeting, May 21, 1999, which allowed the CAB members to see some of the excellent work the students in the EE Department are doing and a chance to participate in the judging. The next Poster Day will be held in the spring.

Congratulations to the following students who won the awards:

Undergraduate

1. Kristopher Dawes:
Measurement of Dielectric Constant Using Waveguide Technique, (Capstone First Place Award Winner)
2. Eric Converse, Carley Bush:
Stepper Motor Light Tracking Device
3. Vero Anderson, David Reece:
Independent CMOS camera system with Ethernet-Based Internet Access

Masters

1. Michael Dougherty
Sperm Whale Acoustic Signal Processing
2. Mingzhou Song, Aiwen Guo
Computer Vision in Polyhedra World with Performance Evaluation
3. Massimilian Ciccotosto
Real-time approach to adaptive techniques for remote sensing applications

Ph.D.

1. Agnieszka Miguel, Alex Mohr
SPIHT for Generalized Multiple Description Coding
2. Gareth Nenninger
Surface Plasmon Resonance Biosensor for Biological Toxin Detection
3. Selim Aksoy
Content-Based Image Database Retrieval

Recent Activities

Faculty/Staff Retreat

A combined faculty/staff all-day retreat was held September 22, 1999 at the Columbia Tower Club.

Activities included a State of the Department report by the chair, introduction of the new faculty, a restructuring update, discussion of strategic planning, and information on ABET activities.

Annual Research Day

The first annual Research Day was held October 22, 1999. The keynote speech was given by Dr. Dan Ling, Director of Microsoft Research, who spoke on the subject of *Disaggregated Computing*. The new faculty gave short presentations about their research directions and a panel discussion was held on the topic of the Internet and the EE/CSE Interface. The day concluded with tours of the lab spaces in the new EE/CSE building.

Corporate Advisory Board Meeting

The second meeting of the Corporate Advisory Board was held on October 22, 1999. The mission of the Corporate Advisory Board is to bring together a select group of accomplished leaders in the world of EE who are committed to providing the highest quality of education to current and future students of EE. This group will provide recommendations on how to better serve the needs of our students and their future employers. The goal is to achieve a standard to excellence that will result in national recognition for the department and alumni.

Welcome, New EE Faculty

After a year-long search process, the Electrical Engineering Department is excited to welcome six new faculty members this autumn. They come from wide-ranging backgrounds and will help bring depth to the many programs offered in EE.

David J. Allstot received the B.S.E.S. degree from the University of Portland in 1969, the M.S.E.E. degree from Oregon State University in 1974, and the Ph.D. degree from the University of California at Berkeley in 1979. He has held industrial positions with Tektronix, MOSTEK, and Texas Instruments, and academic positions with Oregon State University, Carnegie Mellon University, and Arizona State University. He joined the faculty as a full Professor.



Jeff A. Bilmes joined the faculty as an Assistant Professor. He received a B.S. degree in Electrical Engineering and Computer Science from U.C. Berkeley in 1989, a M.S. degree from MIT in 1993, and a Ph.D. in Computer

Science from U.C. Berkeley in 1999. For many years, he also worked and performed research at the International Computer Science Institute in Berkeley, CA. His research interests lie in statistical modeling and signal processing for speech recognition, pattern classification, and audio processing; the statistics of natural objects and scenes; high performance computing systems; and speech-based human-computer interfaces.



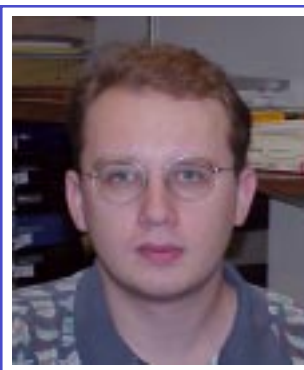
Scott Dunham received a B.S. in Electrical Engineering from Cornell University in 1979, and M.S. and Ph.D. degrees in Electrical Engineering from Stanford University in 1980 and 1985. He was a faculty member in the Electrical and Computer Engineering

Department at Boston University from 1985 to 1999. He joined the faculty as an Associate Professor. His research is focused on the modeling of microfabrication processes and device behavior.

Scott Hauck received a B.S. in EECS from the University of California-Berkeley 1990, and M.S. and Ph.D. degrees in CSE from the University of Washington in 1992 and 1995. He joined the faculty as an Assistant Professor. Prior to that, he was an Assistant Professor at Northwestern University's



Department of Electrical and Computer Engineering. He is currently working on Reconfigurable Systems Hardware and CAD Tools, though he is also interested in Asynchronous Circuits, FPGA Architectures, and Parallelism. He is the director of the Adaptive Computing Machines and Emulators Lab.



Alexander Mamishev received an equivalent of a B.S. degree from the Kiev Polytechnic Institute, Ukraine, in 1992, an M.S. degree from Texas A&M University in 1994, and a Ph. D. degree from MIT in 1999, all in electrical engineering. He joined the

faculty as an Assistant Professor. His research interests include sensor design and integration, dielectrometry, electric power and electrical insulation, electromagnetics, bioengineering, MEMS, optimization, and inverse problem theory.

Mari Ostendorf received the B.S., M.S., and Ph.D. degrees from Stanford University in 1980, 1981, and 1985. She joined the Speech Signal Processing Group at BBN Laboratories in 1985, where she worked on low-rate coding and acoustic modeling for continuous speech recognition. Two years later, she went to Boston University in the Department of Electrical and Computer Engineering, where she taught undergraduate and graduate signal processing and pattern recognition courses and ran a large speech research lab. She joined the University of Washington faculty as the endowed Professor in System Design Methodologies. Her early work was in speech coding; more recently she has been involved in projects on both continuous speech recognition and speech synthesis, as well as some other types of signals. Current efforts include segment-based acoustic modeling for spontaneous speech recognition, dependence modeling for adaptation, use of out-of-domain data in language modeling, and stochastic models of prosody for both recognition and synthesis



importantly, the conference is designed to encourage and absorb new technologies and applications such as intelligent systems, high performance drives, micro machines, actuation, medical instruments, MEMS and new machine designs.

In addition to the regular conference activities, a Hydrogenerator Workshop was part of the IEMDC. The conference commemorated the first time where three major societies cooperated in this field. These societies decided to make the IEMDC a semi annual event, perhaps leading to an IEEE council and future society for machines and drives.

EE Power Program Awarded Grainger Foundation Grant

Recognizing that electric power systems are critical infrastructures for the modern societies, Mr. David Grainger, President of the Grainger Foundation, and Dean Denise Denton, College of Engineering, recently signed an agreement which established the merit-based Grainger Scholarships for undergraduate students and Grainger Fellowships for graduate students. This \$200,000 grant recognizes the strong power engineering research and education program in EE. The Universities of Wisconsin, Madison and Illinois, Urbana, are among the colleges that have received similar grants from the Grainger Foundation. The goal of the Grainger Grant to UW is to attract exceptional U.S. students to the exciting and challenging field of power engineering. Through the fellowships and scholarships, EE expects to increase the number of graduates capable of having significant impact on the power engineering industry in the future.

The IEEE International Conference on Machines and Drives (IEMDC)

The IEEE International Conference on Machines and Drives (IEMDC) was held in Seattle during May 1999. The University of Washington is one of the co-sponsors of the conference in addition to the IEEE Power Engineering Society, the IEEE Industry Application Society and the IEEE Power Electronics Society. The conference chairman is Professor Mohamed El-Sharkawi of the EE department.

One of the purposes of this conference is to consolidate the research in the general field of machines and drives that is scattered across several IEEE, and non-IEEE, societies. But, most

Further information about the Grainger Foundation Grant can be found on the web at: <http://www.ee.washington.edu/energy/apt/grainger.html>.

Students Visit BioRobotics Lab

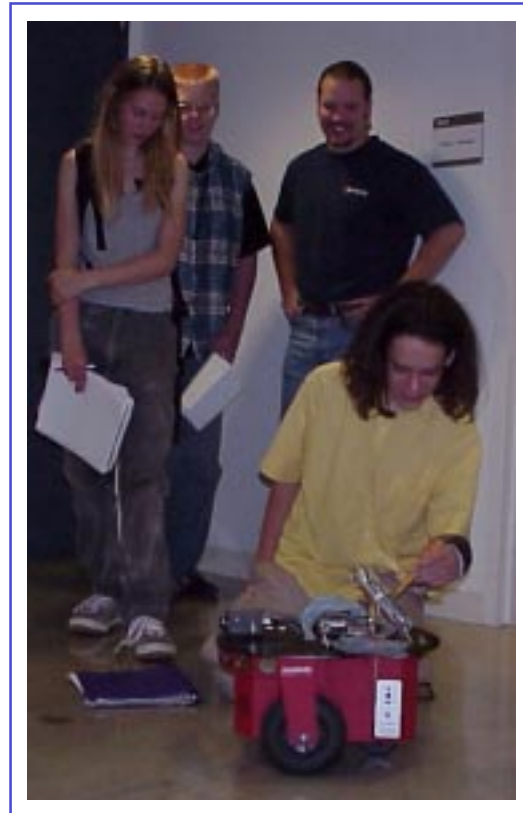
Last month, students from the Exploration High School in Bellingham wanted to visit some “cool” locations on the UW campus. One site they chose was Professor Blake Hannaford’s BioRobotics Lab. After scanning the web for interesting spots, the students arranged the outing themselves. Exploration is an alternative school with 24 students and 4 teachers. Approximately half the school, 12 students, spent a total of three days touring the campus.

While visiting the BioRobotics Lab, the students interacted with a force feedback system that manipulates virtual building blocks within a 3-dimensional virtual environment. In this case, the students were able to practice building a virtual airplane with Legos. The distinctive feature of this virtual reality simulation is that the user not only sees the objects on the screen, but he or she can actually “feel” them as they bump into each other, slide across one another, and then snap into place. (<http://brl.ee.washington.edu/BRL/project/vbb/legostdy.htm>)

Students were also shown muscle spindles developed as part of the Anthroform Arm project. Mechanical replicas of the human arm are being developed to study biomechanical and low-level neural properties of the arm and spinal-reflexive postural control. Functional replicas of muscle spindles were developed to sense the elbow position. Like human muscle

spindles, these sensors contain active elements which change their output functions based on separate afferent neural input signals. (<http://rcs.ee.washington.edu/BRL/devices/spindle/>)

Finally, students were able to interact with a robot donated by Microsoft that is being programed to run under the Windows CE system.



Student inspecting Microsoft CE powered robot



Snapping Legos into place via computer



Congratulations

Carl Sechen, Jenq-Neng Hwang, and Bruce Darling each have been promoted to Full Professor effective September 16, 1999.



And congratulations to our recent spring graduates, listed to the right.



A Message From the Chair

I'd like to take this opportunity to welcome all of the new faculty, staff, and students to the EE department, and to briefly reflect on the past year. The Electrical Engineering Department at the University of Washington is in the midst of a period of dramatic growth and change. During the 1998-1999 academic year, the department



hired a new Chair (me!) and four new Assistant Professors (Karl Bohringer, Richard Shi, Hui Liu, and Denise Wilson). During the Fall 1999 quarter three Assistant Professors (Scott Hauck, Alex Mamishev, and Jeff Bilmes); one Associate Professor (Scott Dunham) and two

Full Professors (David Allstot and Mari Ostendorf) have joined us. During the Spring 2000 quarter, another new Assistant Professor (Vikram Jandhyala) will arrive, and possibly another Associate Professor. In addition, we have announced a search for an additional faculty member in the area of network communications.

The Electrical Engineering Department at the University of Washington is an engine of technological innovation for the Pacific Northwest and the nation. Our external funding level for the current biennium is expected to be approximately \$20 million, and continues to grow at a rapid rate. Approximately one-fourth of these funds are from industry, and there are several spinoff companies that are now developing from intellectual property developed by our faculty, staff and students.

(continued)

Master's Degrees

Al-Hussein A. Abou-Zeid
Paul Kwame Ampadu
Charles Jeremy Brumitt
Frederick Chun-Hung Chen
Emily Clare Erdabl
Richard E Hensel
Robert Andrew Jaspar
Urbada Ketprom
Hayri Gorkem Kuterdem
Kwan Thai Lee
Xinyou Lu
Vincent Harry Offenback Jr.
Robert F. Smythe
Mingzhou Song
Martin Raymond Weikart
Jianyang Xu
Jinyan Zhang

Khalid Ibrahim Al-Fayyadh
John Ralph Angulo
Yun-Ke Chao
Scott Yu-Fan Chu
Rene R Giust
Jeffrey Allen Hester
Robert John Jensen
Kyle Warren Kloeckner
Gregory Stepan Lee
Wei-Te Walter Li
Biakbre Lwai
Duan Thomas Radmer
Chang Liang Song
Somsak Sukittanon
Bing Wu
Michael Kuo-Chih Yang

Doctoral Candidates

Hamed M. Alazemi
Aik Chindapol
Agnieszka Czajka Miguel
Haili Song
Dongxiang Xu
Doctoral Degrees
Ibrahim M. Hallaj
Sam Dupbat Huynh
Christopher Dean Jones
Steven Craig Venema
Gin Sun Yee

Wu-Hsiang Jonas Chen
Gregg Nicholas Hoyer
Tajana Milan Serdar
Yiu Cheong Wu
Jongtae Yuk
Warren Scott Edwards
Frank Samuel Holman III
Mary Holland Johnson
Jisheng Liang
Tzong-Der Wu

BS in EE

William Richard Andersen
Eric Yi-Lei Chan
Jason Ryan Curtiss
Nhan T. Dinh
Kerry Lee Forell
Ted Ray Gooding
Brandon Leon Hewitt
Brendon M. Inman
Huy Tuong Le
Perry Alan McKay
Hung Dai Nguyen
Tho Van Nguyen
Monique Lange Da Rocha Nodland
Son Tuan Pham
Benjamin James Rainey
Peter Michael Richmond
Benjamin Steiger
Elizabeth Matthews Thomas
Duan Nhat Tran
Vangal Krishnan Venkatesh
Nam Phong H. Vu
Adrain Witherspoon
Jae Yun Yu

Steven Daniel Berke
William Wei-Jen Chen
Michael Claude Demartelaere
Nhu Gia Dong
Jeffrey Bradford Fry
Quan Hoang Ha
Alvin Y. Hui
Kristi Leigh Kaamoto
Thy Uyen Le
Gary Allen Melchior
Quan Bao Nguyen
Tung Lu Nguyen
Jennifer Anne Post
David Philip Repp
Michael Leonard Smith
Wing Kit Tang
Tuyen Quang Tra
Si Tan Truong
Thanh Phuong Vo
Brian Patrick Wilson
Xiaogang Yang
Craig R. Ziegler

During the past 10 months, the department structure has been changing to respond to increased faculty size, more students, and changing needs. Fortunately, we are now in the final month or two of this process. Within the next few weeks we will be hiring a new Computing Services Manager and at least four computing staff. We will also be hiring at least four additional engineering staff to support our teaching laboratories and at least 5 fiscal and academic support staff. I want to publicly thank all of the staff and faculty who have helped the department function during this time of temporarily reduced staffing, as the restructuring process has been complicated by staff departures, university bureaucratic delays, questions of funding, and other issues.

Our department motto: "Educational Excellence Through Cutting Edge Research" summarizes our primary goal to become one of the very top EE departments in the world, through the delivery of outstanding and innovative education and the conduct of research of influence. During this fall quarter, the department is developing a strategic plan to help guide this process. I want to thank the many students, staff, and faculty who have participated (and will participate) in the surveys and information gathering stage of this strategic planning, and I would also like to acknowledge the efforts of Prof. Chen-Ching Liu and the entire Strategic Planning Committee. In the next issue, I will report on the progress of the department's strategic planning effort.

Howard Chizeck

K-12 Outreach Program

Elementary Science for Elementary Students (ES Squared)

Denise Wilson, one of EE's newer faculty members, has developed a community outreach program for K-6 grade levels in Washington State. The purpose of the program is to explore the fundamentals of electricity and to bridge the gap between biological and physical sciences in an informative and hands-on set of learning and training activities.

Rich Christie recently met with students at North Beach Elementary in Seattle on the topic of "From Hearing to Microphones." Basic operation of the human ear and characteristics of sound were reviewed



Denise Wilson and fellow future scientists



Rich Christie presents "From Hearing to Microphones"

in relation to hearing. Sound was demonstrated as a pressure wave using visual aids and a speaker operating at very low frequencies. Biological (ear, vocal cords) and artificial (speakers, microphones) sound systems were compared. Students experimented with comparing the effects of sound on their ears to similar effects on artificial systems and evaluated which system was better for hearing different sounds.

For information on other topics and a demonstration schedule, see <http://www.ee.washington.edu/faculty/wilson/K12/ES2/index.html>. If you are interested in participating as a presenter, contact Denise Wilson, 206-221-5238, wilson@ee.washington.edu.