The Integrator

UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING
A Community of Innovators

Undergraduates Win Bronze Medals at iGEM Competition

The UW 2008 iGEM team: Bryan Bartley (BioChem), Tyler Casey (EE), Scott Mason (BioChem), Alec Nielsen (BioE), Jeff Nivala (BioE), Paramjit Singh Sandhu (CompE/EE) and Faifan Tantakitti (BioE).

In November of 2008, seven undergraduate students from the departments of Bioengineering, Electrical Engineering, Computer Science, and Biochemistry traveled to MIT and won bronze medals at the international Genetically Engineered Machine (iGEM) competition. Out of 84 teams, the UW team also received runner-up for Best Presentation.

The iGEM competition is an annual competition in the field of synthetic biology, a rapidly emerging field that attempts to make biology easier to engineer by applying engineering principles such as abstraction, standardization, and decoupling. In preparation for iGEM, teams receive toolkits that contain biological "parts." Their standardized form allows students to easily combine these parts in novel ways to generate biological devices with new, and potentially useful, properties. Over the summer, students design, model, and construct their own biological machines, which are only limited by the imagination. Projects at the 2008 iGEM Jamboree ranged from bacterial kidneys to novel vaccines.

The UW students, advised by professors Eric Klavins (EE), Herbert Saurio (BioE), and Stanley Fields (Genome Sciences), chose to generate a strain of E. coli bacterium that could transfer abilities (in the form of genes) into eukaryotic cells in a controlled manner. They used yeast as a model eukaryotic organism. Specifically, they wanted their engineered E. coli to transfer into yeast the ability to metabolize the sugar lactose, but only when lactose is present in the environment and when glucose is absent. They named the model for this construct the "Vector Jector," and subdivided it into four engineering modules—two for yeast, and two for E. coli.

The UW iGEM team spent the summer constructing the four modules of the Vector-Jector from standard biological parts. They also modeled the behavior of the system using differential equations, and worked on a software tool that would help future teams to model and build genetic circuits.

In this issue

Message from the Chair

Despite these challenging economic times, UW EE continues to make progress. Highlights of this momentum are evident in our recent faculty hires, departmental accomplishments, and the establishment of new fellowships and scholarships.

We have made four significant hires both in core and emerging research areas this academic year. I am confident that professors Anant Anantram, Shwetak Patel, Chris Rudell, and Georg Seelig will have a positive impact on the department as research and education becomes progressively more interdisciplinary (page 3).

Our current faculty and students are also making great strides. Several have won prestigious awards or are taking on new roles. Assistant professor Maya Gupta received the PECASE award for her outstanding work in statistical learning and signal processing.

Last November, seven undergraduate students led by assistant professor Eric Klavins won bronze medals in the iGEM Competition at MIT in the field of synthetic biology. And, Professor Mari Ostendorf has accepted a new role in the College of Engineering as the associate dean for research.

Even amidst these difficult economic times, we are fortunate to have new fellowship and scholarship endowments thanks to our generous alumni and friends. These scholarships and fellowships will help attract the brightest students to our department, and will provide support during a time when the need is increasing.

Leung Tsang
Professor and Chair

Gupta Receives PECASE Award

Congratulations to assistant professor Maya Gupta, who received the 2007 Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor given by the US Government to junior investigators. This prestigious award was created to honor and support the extraordinary achievements of young professionals at the outset of their independent research careers in the fields of science and technology. Recommendations are made to the White House by participating agencies.

Gupta was nominated by the Department of Defense for her accomplishments in statistical learning and signal processing. She and the other 66 awardees were welcomed at the White House for a ceremony and reception with former President George Bush and John Marburger, the Science Advisor to the President. About that experience Gupta says, "I was surprised at how small the White House is, and meeting George Bush in person reminded me that the world just isn't that big, and that we all need to pitch in if we're going to get this century's problems solved."

Recent Faculty Awards & Honors

- **Maryam Fazel**
  NSF 2009 Career Award

- **Hui Liu**
  2009 IEEE Fellow

- **Eve Riskin**
  2009 IEEE Fellow

- **Babak Parviz**
  Time Magazine's #24 for "Best Invention of 2008"

New Faculty Hires

Shwetak N. Patel joined the faculty in September 2008 as an assistant professor in both EE and CSE. He received his PhD in Computer Science from the College of Computing at the Georgia Institute of Technology. There, he was a member of the Ubiquitous Computing Research group, served as the assistant director of the Aware Home Research Initiative, and was a National Science Foundation Graduate Research Fellow. Patel's past work received the designation of a Top Technology Idea of the Year from New York Times Magazine in 2005. Patel's research interests include Human-Computer Interaction, Ubiquitous Computing, User Interface Software and Technology, Sensors, and Embedded Systems with a particular emphasis on developing and applying new low-cost, easy-to-use hardware and software solutions to enable novel activity sensing applications.

Georg Seelig joins the faculty in spring 2009 as an assistant professor. He received his diploma in physics from the University of Basel in 1999 and his PhD in theoretical physics from the University of Geneva in 2003. For the last few years, he has been a research associate at Caltech with Erik Winfree and Michael Elowitz. In 2008 he received a Career Award at the Scientific Interface from the Burroughs Wellcome Fund. Seelig is interested in understanding how biological organisms process information using complex biochemical networks and how such networks can be engineered to program cellular behavior. His research aims to identify the systematic design rules for the de novo construction of biological control circuits with DNA and RNA components. His approach integrates the design of molecular circuitry in the test tube and in the cell with the investigation of existing biological pathways like the microRNA pathway. He is applying engineered circuits and circuit elements to problems in disease diagnostics and therapy.

M. P. Anantram (Anant)

joined the EE department as a professor in winter 2009. He comes to UW from the University of Waterloo, where he was a professor of nanotechnology engineering. Earlier, he worked for nine years at the NASA Ames Research Center in Silicon Valley. Anant has a varied educational background including a BSc in applied sciences from PSG Tech, MSc in physics from University of Poona, and a PhD in electrical engineering from Purdue University. His research addresses theory and computational models to study molecular, semiconductor, and bio-nano structures. His goal is to build design tools sophisticated enough to understand the device physics and then perform extensive design analysis before expensive fabrication.

Jacques Rudell joined the faculty as an assistant professor in January 2009. He received his BSEE from the University of Michigan Ann Arbor and his MSEE and PhD from UC Berkeley. Prior to joining the department, Rudell worked at Intel Corporation as a researcher in the Advanced Radio Technology Group. Rudell's research interests cover a broad area related to analog, mixed-signal, RF, and mm-wave circuits. His work at UW will focus on novel architectures and circuits to overcome the challenges presented by low-cost silicon technologies, such as ultra-low voltage, low-intrinsic device gain, and poor matching characteristic. Other research interests include mm-wave circuits for 60GHz and imaging applications, low-voltage highly-efficient transmitter systems, ultra-low power RF for cellular based sensor networks, high-speed I/O for chip-to-chip and core-to-memory applications, and integrated circuits for bio-medical applications.

New Gifts Expand Support for Students

Winter Estate Bequeaths $600,000 to EE

The Winter Estate bequeathed an additional $600,000 to the Arthur Burman Winter Endowed Scholarship, established in EE in 2002 by Arthur Burman Winter, a resident of Everett and a 1934 graduate of EE. This fund provides financial assistance to junior and senior EE students demonstrating both financial need and academic merit.

Tradition Born: First All-College Scholar-Donor Luncheon

Nearly 200 donors, students, faculty, and staff participated in the first annual College of Engineering Scholar-Donor Luncheon at the UW Don James Center on December 3, 2008. The event connected donors with the recipients of scholarships, fellowships, awards, and other student support funding throughout the College. Donors, including EE graduates Chris Kenworthy (BSEE '76) and Rob Shanafelt (BSEE '67), enjoyed the opportunity to interact with the students who benefit from their gifts. The success of this inaugural event underscored the importance of bringing scholars and benefactors together, and plans are under way for next year's celebration.

Irene Peden Fellowships Invested

As of January 1, all seven Professor Irene C. Peden Electrical Engineering Fellowships have been invested. Thanks to the generosity of Irene and Leo Peden, several EE faculty members, alumni, and friends of the EE department, and the leadership of Professor Eve Riskin, the fellowship now exceeds $97,000 in gifts and matching funds. It will be exciting to recognize the first Peden Scholar in fall 2009.

Campuswide Campaign for Students Completed

The Faculty-Staff-Retiree Campaign for Students concluded on December 31, 2008. This program enabled those closest to the UW to establish funds with special meaning to them. These named student support endowments, created with a minimum gift of $5,000, were matched by the UW dollar for dollar, up to $10,000. Faculty, staff, and retirees used this program to create 75 new endowments benefitting the College of Engineering, with 14 designated for EE.
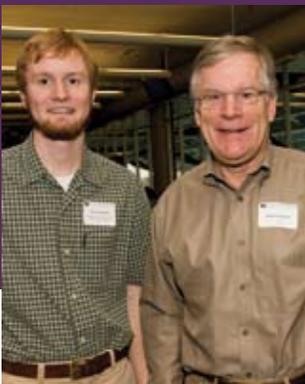
2009 Leadership Seminar Series

During winter quarter, students had the opportunity to hear from leading executives from diverse companies who all have at least one thing in common—a UW EE degree. Each week one of our successful alumni shared insights on the skills, attributes, and approaches that can lead to outstanding careers. This engaging and informative seminar puts our students in touch with professionals they otherwise might not have the opportunity to meet. This year's alumni speakers at the EE Leadership Seminar Series included:

- **Gerald McMorrow** *(BSEE '74, MSEE '78)*
  CEO, Founder & Chairman, Verathon, Inc.

- **Bror Saxberg** *(BSEE '80)*
  Chief Learning Officer, K12, Inc.

- **Gary Swofford** *(BSEE '68)*
  General Manager, Swofford Energy Consulting, LLC

- **Tom Rolander** *(MSEE '76)*
  CTO & Co-founder, CrossLoop, Inc.

- **John Ehrenberg** *(PhD '73)*
  President & CEO, Hydroacoustic Technology, Inc.

- **Brian Otis** *(BSEE '99)*
  Assistant Professor, UW EE

- **John Branch** *(BSEE '91)*
  Partner, Darby & Darby

- **George Huang** *(PhD '73)*
  Chairman & CEO, FutureDial

Rolander to Speak at Commencement
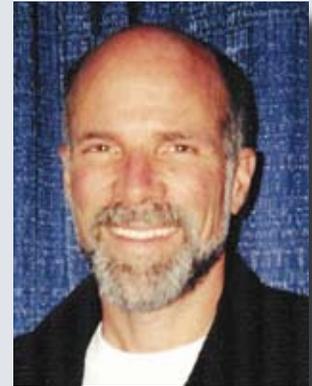
Tom Rolander (MSEE, 1976) is the chief technology officer and cofounder of CrossLoop, Inc., a global marketplace for computer support and training. Although it's the fifth software company Rolander has launched, his passion for innovation remains as fresh today as when he was a UW student.

Previous ventures included serving as the vice president and CTO for Benetech, the senior architect and director of research and development at Novell, the CTO and CEO of PGSoft, and the vice president of engineering and research and development at Digital Research.

Rolander tempers the intensity of his work life with equally ambitious athletic pursuits as an avid sailor, pilot, cyclist, and runner. We look forward to welcoming Tom back to campus in June.

Meet Marty Riemer
Master of Radio & Visual Media

If you live in the Seattle area, you've most likely listened to the 7:20 a.m. or 5:20 p.m. "Funny" on 103.7 The Mountain — short comedy routines that make rush-hour commutes a bit more bearable. These entertaining interludes are brought to you by Electrical Engineering alumnus Marty Riemer (BSEE '84, MSEE '89). He is the creator of the "Funnys" and host of The Marty Riemer Show, weekdays from 5:30–9:00 a.m. on The Mountain.

As an undergraduate, Riemer worked part-time at the UW radio station, KCMU. "The station had few listeners and even fewer students interested in working there because it played 'heavy metal' or what would now be considered 'classic rock,'" Riemer recalls. In fact, the entire broadcast division of the communications department was in jeopardy of being eliminated, the radio station along with it. Riemer and a few other students ingeniously changed the genre to alternative and played progressive new artists, which saved the station and shaped it into today's successful, listener-supported KEXP.

While pursuing his MSEE, Riemer worked part-time at Seattle stations KZOK and KJR. He recalls that his EE advisor, Mark Damborg, was supportive of his radio jobs, aware that the full tuition coverage, steady income, and free movie and concert tickets they supplied were ideal for a student.

"I most remember Marty's cheerful enthusiasm, boundless energy, and humor," Professor Emeritus Damborg says. "We found a project

that was rather nontraditional, integrating engineering analysis software with databases. I think we both had a good time. It was a pleasure to have him as a student, and he put his UW experience to good use."

It seems Riemer was genetically predisposed to study engineering; his father holds a doctorate in EE and spent much of his career at Boeing. Riemer's older sister, who owns and operates a Scanning Electron Microscope analysis lab in Snohomish, Wash., earned her doctorate in material science from the UW. Riemer's aptitude for engineering showed early, demonstrated by his problem-solving skills and technical acumen following his first encounter with radio at age 13.

On a drive to the Washington coast, his family stopped at a radio station near Aberdeen to visit some friends. "It made a huge impression on me. I was enthralled with the energy in the studio and fascinated by how the DJ, though alone, was interacting with thousands of unseen listeners. It was — and is — surreal," recalls Riemer. He passed up the

visit to the ocean to stay behind at the station for several hours.

Immediately after that experience, Riemer told his dad that he wanted to work at KGRG at Green River Community College in Auburn. His father wasn't thrilled about the proposition, but agreed to let him pursue a volunteer position at the station, with one stipulation: he first had to obtain all three classes of commercial radio operator licenses so people would take the 13-year-old seriously. Apparently, only the basic third-class license, covering radio rules and regulations, would have been necessary. Second-class was required to operate, repair, and maintain a radio station while first class was required to operate, repair, and maintain a television station. With a clear propensity for the subject matter, Riemer earned all three licenses in just six months.

Riemer accepted an engineering position after receiving his MSEE, but six months later he was offered a full-time position at Seattle radio station KXRX 96.5FM — The X. He regards his decision to take the job as profound, decisively choos-

Alumni on the Radar - *EE Class Notes*

We would like to hear from you! Check out our Alumni Connections web page to read a complete list of updates from your former class-mates, or to provide an update of your own:

www.ee.washington.edu/people/alumni/index.html

ing to pursue his passion. "I credit engineering with providing me with the confidence that I could do anything," Riemer says, "and I have always felt grateful for my EE degrees."

After KXRX changed hands in 1995, Riemer launched a video production company called Twisted Scholar. "Visual media was the logical next step after so many years communicating via radio," he says. "I couldn't have created this company without my EE degrees. My education provided the technical skills to understand and operate video workstations that were truly on the cutting edge of film and video production at the time. Most of my competitors were intimidated by these new "black box" editing systems, whereas I financially couldn't have afforded anything else. As a result, Twisted Scholar was established as a cost-effective, technically progressive production company."

Marty lives in West Seattle with his wife, Karrie, and their two year-old daughter, Josephine.

Mark Lauritsen, *BSEE '75*
Plano, TX – After graduating from UW EE, Lauritsen worked for Boeing on B-1 and B-52 avionics software for five years, then moved to Dallas to develop avionics flight and simulation software for the F-16. A combination of defense industry consolidations and the Telecom bust in 2002 led to some 30,000 engineering layoffs that still affect the area today. Thousands of jobs were outsourced offshore, so Lauritsen began consulting nation-wide as an avionics systems/software engineer for his own company, Mach 2 Flight Software, as he continues to do today.

Garrison Greenwood, *PhD '92*
Gearhart, OR – Greenwood is a professor in the ECE department at Portland State University. On January 1, 2009, he became the editor-in-chief of the *IEEE Transactions on Evolutionary Computation.*

Edith Novy (formerly Bailey), *MSEE '00*
Santa Clara, CA – Novy is doing digital verification at Atheros Communications in Santa Clara, Calif. Some of the fascinating things that she works on include next-genera-tion wireless semiconductor devices (WiFi, Bluetooth, GPS, etc). Prior to Atheros, Novy worked at Matrix

Semiconductor, a 3-D memory start-up, and Cypress Semiconductor.

Barna Ibrahim, *MSEE '06*
Watsonville, CA – Ibrahim is an Intel field application engineer man-aging Intel Embedded customers in the California Bay Area. She worked on the Intel Pricing Team, and the Performance Benchmarking Team. Ibrahim also spent a year in Germany as Intel EMEA (Europe Middle East and Africa) competitive marketing manager.

Alumni Pay Tribute to Ward Helms

Alumni and friends of UW EE gathered on February 11 in San Francisco's South Bay area to honor Professor Emeritus Ward Helms. Professor David Allstot hosted the event with 20 attendees at a Mountain View restaurant.

Ostendorf Named New Associate Dean for Research

Professor Mari Ostendorf has assumed a key leadership role in the College of Engineering as the new associate dean for research and graduate studies. "Mari brings to the position a wealth of experience, creativity, and a strong dedication to research," said Dean Matt O'Donnell. "Under her able leadership we expect to maintain our research momentum, even as we face economic challenges."

Ostendorf will focus on supporting multidisciplinary collaborations across departments within and outside the college, working with new faculty to develop successful research programs, and strengthening programs to recruit and mentor top graduate students.

Last spring Ostendorf received the college's Faculty Innovator Research Award. She leads an internationally recognized research program in speech recognition and spoken language processing, and has participated in several multi-university and international projects. Current research interests include acoustic and language modeling for rich transcription of spoken language, the use of prosody at the interface between speech and language, learning with sparse data resources, and language technology for bilingual education. She is a Fellow of IEEE and ISCA and this year joins the Board of Governors of the IEEE Signal Processing Society.