

The Integrator

UW EE Launches New Corporate Affiliates Program

Beginning Fall 2012, the Electrical Engineering Department plans to launch a new Corporate Affiliates Program (CAP). The mission of the EE CAP is to advance industry-department collaboration and to create innovations in areas relevant to the needs of high-tech industry through research, entrepreneurship, curriculum enhancements, and close interaction.

From local companies to international corporations, UW EE faculty and students have maintained close relationships with industry. As a member of the EE CAP, corporate partners will benefit by gaining access to students, cutting-edge research projects, world-class faculty, and the ability to network with leaders in industry. In return, the department will gain close and relevant interaction and advice from valuable partners.

Department Forms Advisory Board

The department is pleased to announce the formation of an external advisory board chaired by Dr. Henrique Malvar, Chief Scientist at Microsoft Research, member of the US National Academy of Engineering.

The Electrical Engineering Advisory Board will convene annually to assess initiatives, develop strategies and make recommendations to the chair. They will also advocate for UW EE both inside and outside of the university. Members bring a diverse range of rich experiences and expertise to the table related to the department's top research areas, industry trends, and entrepreneurial growth.

"I hope to glean as much as I can by brainstorming with the board about topics of strategic and tactical interest to the department," said professor and chair, Vikram Jandhyala. "This is an exciting and challenging time for the department, with many positive changes on the horizon – it will be a privilege to bounce ideas with this distinguished group of individuals."

To learn more about the UW EE Advisory Board, visit:
www.ee.washington.edu/about/advisory_board/index.html

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First Annual UW EE CarEEr Fair And HKN Poker Night

Wednesday, January 23rd, 2013

The HUB, Room 145

Career Fair: 3:00pm - 5:00pm

Poker Night: 6:00pm - 11:00pm

Interested in participating as an employer?

For more information, visit:

www.ee.washington.edu/about/cap/StudentRecruiting.html



Message from the Chair

Welcome new and returning UW EE friends to another exciting, productive and rewarding academic year. One of our newest additions to the department is assistant professor Brandon Pierquet. His hiring continues to bolster UW EE's strength in the strategic area of sustainable energy. Welcome Brandon!

Last spring the department had our 10-year review. The committee noted several key strengths in the department, which included our high-demand, high-value undergraduate degree, our PMP program that helps professional engineers upgrade their skills, and the world-class research of our faculty and students.

Building from the recommendations made by the committee, we are already making progress through the formation of our distinguished and active Advisory Board. The board will play an important role in defining strategic areas for research investment, modernizing the undergraduate curriculum, branding the department and helping with development. We are also launching our new Corporate Affiliates Program (CAP) this year with the goal of supporting the mutual needs of academia and industry and enhancing industry-department collaboration. The program will kick-off with our first annual EE Career Fair on January, 23rd. I encourage all interested employers and students to learn more about CAP and the Career Fair at: www.ee.washington.edu/about/cap/StudentRecruiting.html

We are in the midst of an exciting and active faculty search for multiple positions related to our strong core curricula and strategic research areas of energy, medical and molecular systems and devices, and big physical data. It promises to be an exciting year!

Vikram Jandhyala
Professor and Chair

Pierquet Joins UW EE

The department welcomes Brandon Pierquet, who joined the faculty as an assistant professor this fall. Pierquet adds significant strength to the department, college, and university's growing leadership position in the multidisciplinary and strategic area of sustainable energy.

Pierquet received his PhD and S.M. degrees from the Massachusetts Institute of Technology in 2011 and 2006 respectively, and his B.S. degree from the University of Wisconsin-Madison in 2004, all in electrical engineering. Upon graduating, he worked for Enphase Energy as a senior design engineer, developing grid-tied power converters for distributed solar applications.



Most recently, Pierquet was selected to receive \$764,000 from the Washington STARS Researcher Program. The Strategically Targeted Academic Researchers (STARS) program supports new faculty conducting innovative research in the State to promote productive innovation and longer-term statewide economic development. His research focuses on the design of electronic systems, with particular interest in power electronics and their control. This includes applications in smart-grids, photovoltaic systems and electric vehicles. **EE**

Faculty Hiring

The Electrical Engineering Department at the University of Washington SEEKS TO HIRE multiple tenure-track faculty members at the rank of Assistant, Associate, or Full Professor to start in Fall 2013. While all areas related to EE are of interest, and applications at all levels are invited, particular emphasis is on candidates for tenure-track assistant professor positions whose expertise blends well with the Department's strategic areas of energy, biology and medicine, big data, and the integration of hardware, systems, and algorithms.

For additional information, please refer to our website: www.ee.washington.edu/facsearch/

EE Students Focused on Sustainable Energy Solutions

Lawrence & Lucille Frey Endowed Scholarship Making it Possible

Many engineering students come into the field wanting to address global challenges, apply problem-solving skills and develop solutions. That's certainly the impetus behind the study and research of two electrical engineering juniors, Anastasia Corman and Degene Mersha. Both of them view renewable energy as a growing industry with potential to help reduce US energy costs and dependency on foreign oil. More globally, they see it as an opportunity to assist developing countries and lower the carbon footprint.

Coincidentally, Anastasia and Degene were admitted to the department as transfer students demonstrating their academic achievement in a highly competitive admissions process. They continue to excel and are both recognized on the Dean's List for their success. After completing her bachelor's degree, Corman plans to go on to graduate school maintaining her focus on alternative energy. Mersha is seeking a broad undergraduate education that allows him to understand the impact of electrical engineering solutions in a global, economic, environmental and societal context.

Like so many UW students, funding an engineering education has been a challenge for Corman and Mersha. Degene has been working full-time while attending the UW in order to support his family and pay for his education. He is the first in his family to pursue a college degree. Anastasia and her husband are both full-time students and concerns about student debt loom heavy. The combination of state budget cuts and tuition increases have significantly impacted the department's ability to



support students. At the height of the economy in 2008, EE gave approximately 45 quarters worth of tuition support to 28 deserving students. Today, in order to sustain awarding the same number of students, the department has had to cut the number of quarters of tuition support to 23, which is a 51% reduction.

Anastasia and Degene are fortunate to be recent beneficiaries of the Lawrence and Lucille Frey Endowed Scholarship in EE. This scholarship was established as an estate gift from these generous donors. Lawrence was a UW employee and worked for the EE department for 34 years from 1946 to 1980. He held several positions, including instrument machinist, electrical instrument repairman, and shops and instrument maker supervisor. Frey tinkered with gadgets and machines. He was married to Lucille and when he died in 2010, at the age of 96, they left a sizeable gift in their estate to establish a much needed scholarship in EE.

The Frey's have made it possible for these two students to worry less about their financial situations and more about their educations. Corman hopes to go abroad next year to examine renewable energy in other countries. "This scholarship will help me achieve that goal," says Corman. For Mersha, growing up in Ethiopia forced him to face a variety of challenges and that helped him understand the value of education. "The Frey Scholarship means a lot to me because it significantly reduces my financial burden," says Mersha.

Those who support electrical engineering students through their estate plans not only leave a lasting legacy but make real differences in the lives of students. These gifts promote new ideas and help create leaders, thinkers and doers who, like Anastasia and Degene, want to change the world for the better. **EE**

If you are interested in discussing planned giving options, endowments, or supporting UW EE with a current use gift, contact Mahnaz Sherzoi at: mahnaz@uw.edu or 206-685-1927.

Sound Bytes on Research

Faculty and students at UW EE are engaged in many innovative research projects that have the potential for life-changing applications. Here is just a sampling of a few projects that have gained noteworthy attention. For more in-depth information about the cutting-edge research happening in EE, check out the department's annual research review, EEK (Electrical Engineering Kaleidoscope):

www.ee.washington.edu/news/EEK/index.html

Portable Diagnostics

Description: Researchers from UW EE's MEMS Lab, directed by professor Karl Böhringer have built and patented a surface that, when shaken, moves drops along certain paths to conduct medical or environmental tests. The low-cost system requires very little energy and avoids possible contamination from diffusion or damage from electrifying the samples in order to move them. Inspired by the lotus effect, the UW team built a surface with tiny posts of varying height and spacing.

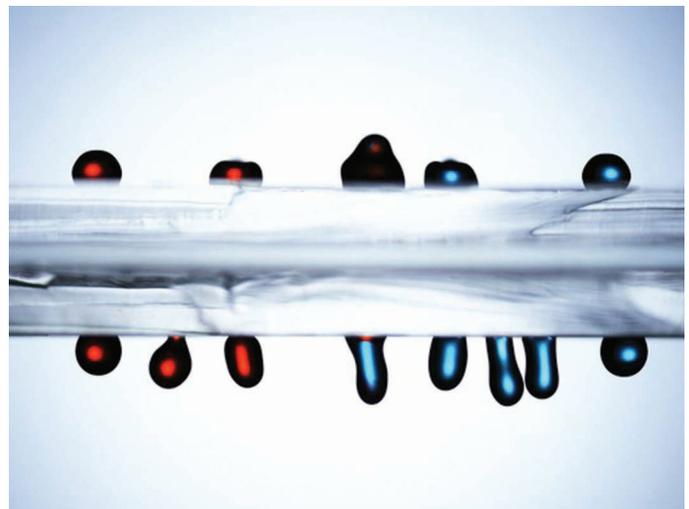
When a drop sits on this surface, it makes so little contact with the surface that it's almost perfectly round. By vibrating the platform at a rate of 50 to 80 times per second, the asymmetrical surface moves individual drops along predetermined paths to mix, modify or measure their contents. Changing the vibration frequency can alter a drop's speed, or can target a drop of a certain size or weight.

Application: The ability to move and mix small samples of liquid could provide a way to shrink diagnostics down to a size small enough to fit in a person's pocket.

Read More: www.washington.edu/news/2012/05/09/portable-diagnostics-designed-to-be-shaken-not-stirred/



Scan the QR code with your Smart Phone to learn more about portable diagnostics.



Drops of red and blue liquid move along the upper and lower surface of the vibrating UW platform at speeds up to 1 inch per second. This combined image shows drops as they move toward the center and merge. Copyright 2012 Wiley.

App Lets You Monitor Lung Health Using Only a Smartphone

Description: A new tool developed by researchers from UW EE's Ubicomp Lab directed by professor Shwetak Patel, UW Medicine and Seattle Children's hospital lets people monitor their lung function at home or on the go simply by blowing at the screen of their smartphones. The *SpiroSmart App* produces results that come within five percent of commercial devices, meaning it already meets the medical community's standards for accuracy.

Application: Pulmonary function tests can be made cheaper and more convenient through this

app. More frequent testing at home could also detect problems earlier, potentially avoiding emergency room visits and hospitalization.

Read More: www.washington.edu/news/2012/09/18/app-lets-you-monitor-lung-health-using-only-a-smartphone/



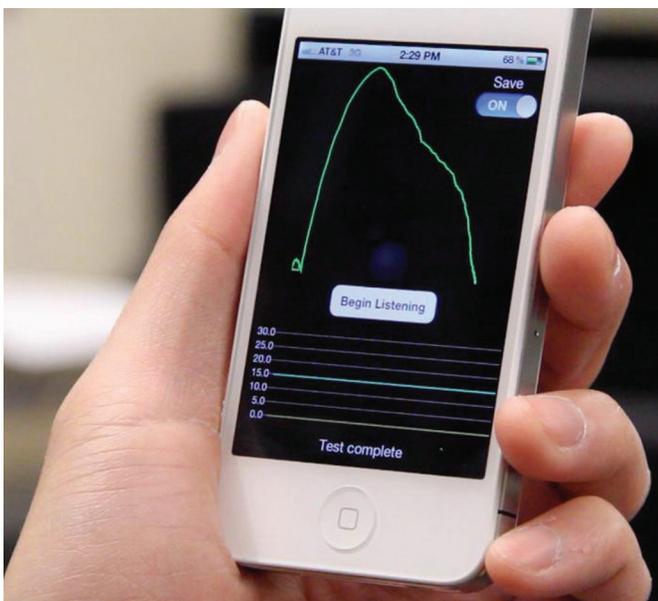
Scan the QR code with your Smart Phone to learn more about the SpiroSmart App.

Application: Researchers who track the social activities of birds and animals can do so remotely and in real-time.

Read More: www.washington.edu/news/2012/09/20/the-original-twitter-tiny-electronic-tags-monitor-birds-social-networks/



Scan the QR code with your Smart Phone to learn more about the Encounternet system.



SpiroSmart is a research app to let people test their lung function using only a smartphone.



C. Rutz, St. Andrews University.

A study led by St. Andrews University in Scotland tagged New Caledonian crows to learn about their social behavior.

Tweet Tweet: Monitoring the Social Networks of Birds

Description: Tiny radio tags designed by Associate Professor Brian Otis and EE Affiliate Associate Professor John M. Burt can, for the first time, provide detailed data about birds interacting in the wild. These tags weigh less than 1 gram and attach to the birds with a degradable strap that separates from the subject when the battery dies. The system called *Encounternet*, combines digital radio tags on animals with sturdy wireless base stations. The team has deployed hundreds of these nodes in the field and are in the process of commercializing this technology.

Faculty Accolades

Kai-Mei Fu, *Assistant Professor*
NSF CAREER Award

Shwetak Patel, *Assistant Professor*
India Abroad, Face of the Future Award
Georgia Tech GVU Impact Award

Leung Tsang, *Professor*
IEEE Electromagnetics Award
Election to Washington State Academy of Sciences

Rico Malvar, *Affiliate Professor & EE Advisory Board Chair*
Election to Washington State Academy of Sciences
Election to National Academy of Engineering

Vikram Jandhyala, *Professor & Chair*
UW C4C Presidential Entrepreneurial Fellow

WHERE ARE THEY NOW?

A Look at Emeritus Faculty: Peter Lauritzen

When you leave the classroom and the research lab, what's next? For one emeritus faculty member, Peter Lauritzen, the interest in learning and innovation has continued.

Upon retiring in 1998, Professor Lauritzen developed a web site to make his research on compact models for power semi-conductors available to the public for free. He has attracted interest from around the world and his work has been translated into a variety of languages. This effort makes sense since he was an early pioneer in online learning. Described at the time as "self-paced courses," Lauritzen recorded lectures on video tape and made them available to students unable to attend class. He was an early adopter of the use of available technology because he knew it would be a game changer in providing both access and flexibility for students.

Making his home in Port Townsend, Wash., Professor Lauritzen has dedicated time to exploring non-motor transportation through an active community group. As an advocacy group, walking and bike riding is encouraged and they support this effort through building trails and publications of maps.

In 2009, Lauritzen received the Volunteer



of the Year Award from the mayor of Port Townsend. He lives in a co-housing community and enjoys traveling and time with his three grandchildren.

When he reflects on his time at the UW, he fondly recalls his active research lab where they explored the physics behind noise generation devices. The field expanded as a result of his efforts. Cross-disciplinary teaching now encouraged and often the norm, was less a part of the culture in the 70's. Lauritzen remembers a collaborative course he taught on social constraints to engineering design. In this class they explored case studies involving conflicts between technology and society or the environment. The class included profiles of controversial figures such as Ralph Nader. Another highlight was a teaching Fulbright in Madras, India for six months and also in Denmark.

As a pioneer on many fronts, Lauritzen continues to explore ways to improve life—either as an electrical engineer or as a community member. **IE**

UW Alumni Association & Chiao Build Presence in Taiwan



Over five hundred UW alumni living in Taiwan have reconnected with the UW as a result of the volunteer leadership of Arthur Y.C. Chiao (MSEE '80). As chairman, Chiao pursued formal recognition of the organization by the Taiwanese government and development of an approved charter. In addition to fostering opportunities for alumni to make connections,

this effort has also facilitated the ability to transfer individual gifts to the UW.

Events sponsored by the UWAA in Taiwan offered alumni the chance to meet with university leaders including Interim President Phyllis Wise (2011) and College of Engineering Dean Matt O'Donnell. Collaboration with Taiwanese industry and academic institutions is building including formal faculty and student exchanges between the UW and National Cheng Kung University.

Chiao is chairman and chief executive officer of Winbond Electronics Corporation and serves as chairman of the Taiwan Electrical and Electronics Manufacturer's Association—the largest professional industry group in the country. He currently serves on the UW College of Engineering's Visiting Committee providing an international perspective to the dean.

Parker Ma, secretary general of UWAA Taiwan, noted, "I really appreciate what Arthur has done. He was committed to establishing UWAA Taiwan and during his term as chairman, he built valuable alliances and a strong foundation for Huskies in Taiwan. As a local, I am grateful for his leadership."

Last summer, Chiao stepped down from his leadership role and Dr. Kung-Yee Liang, UW Biomathematics and Biostatistics PhD, will chair the group. Dr. Liang is president of National Yang-Ming University.

"Our alumni residing in Taiwan now have an established way of reconnecting with each other and with the UW thanks to Arthur Chiao's efforts," says professor and chair, Vikram Jandhyala. "We are thankful for the work he has done to establish and successfully grow UWAA Taiwan." 

Alumni on the Radar - EE Class Notes

We'd like to hear from you! Check out our Alumni Connections web page to read a complete list of updates from your former classmates, or to provide your own:

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

Tianyi Ma, BSEE '12

Kenmore, WA – Through hard work, Ma received the annual Dean's List Award with a major GPA of 3.72. Ma likes to play tennis and plays for the 3.0 USTA league team.

Ryan Clemente, BSEE '12

Bakersfield, CA – Clemente is appreciative of his power professors (Damborg, Christie, El-Sharkawi) for teaching him the importance of group work and process thinking for problem solving. He began working at Oxy in January, 2012 where he manages capital projects related to the electrical distribution system for his company's operations. Clemente's education has instilled the technical knowledge of power systems to which he encounters everyday from transmission lines, to substations, electronic relays, motor control centers, and motor drives. Thanks for a great time UW EE!

Chris Michael, MSEE (PMP) '10

Seattle, WA – Upon graduating from the PMP, Michael started a new job at Phantom Works in the Boeing Company where he is able to apply the electromagnetics courses he took in the PMP program and his mechanical background from his undergraduate degree.

Hans Otten, BSEE '09

Portland, OR – Upon graduating from UW EE with a focus in wireless communications and electromagnetics, Otten assumed a position as a Product Marketing Engineer at Tektronix and was responsible for broadening the Tektronix RF portfolio. He was the driving force behind the release of a family of USB power sensor products, the first of their kind from Tektronix. Currently Otten is an Inside Account Manager and supports four regional areas within the United States. He also manages software revisions for the power sensor product line and is the architect and administrator of a cloud based RF support site for field application engineers. A resident of Portland, Oreg., Otten is an elite distance runner and owns a corporate entertainment business where he performs as a professional entertainer and magician.

David Burnett, BSEE '05, MSEE '07

CA – Burnett has been awarded the 2012 National Defense Science and Engineering Graduate (NDSEG) Fellowship.

Vikram Jandhyala
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New Certificate in Smart Grid & Renewable Energy

Led by Close Professor Daniel Kirschen, this Certificate was developed in response to industry needs by training engineers in smart grid technologies and equipping them with the necessary tools to deal with the integration of renewable energy sources (such as wind and solar) in the grid. Students can enroll for credit or non-credit. If taken for credit, courses can be applied toward the Master of Science in Electrical Engineering. 2012-13 courses include:

Substation Distribution & Automation: Covers the principles and reasoning that serve as the basis for modern power systems and the need for new technologies

Renewable Energy Systems: Covers the theory of electric energy generation systems, modeling and analysis of power generation systems, and renewable energy resources

Integration of New Energy Sources: Covers the operation and modeling of wind and photovoltaic energy systems, including power electronic converters

For more information, please visit:

www.ee.washington.edu/admissions/pmp/certificates.html

