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Alumnus Richard Citta Receives Diamond Award

Richard Citta (MSEE '71) is the recipient of the UW College of Engineering's 2010 Diamond Award for Distinguished Achievement in Industry. Citta and four other outstanding alumni and friends have been chosen by a committee of peers to be recognized for their significant contributions to the field of engineering.

Digital TV was just science fiction when Richard Citta was working on his master's degree at UW EE. However, as a research engineer at Zenith Electronics, he played a critical role in pioneering HDTV, thus ensuring that our sets are beaming gloriously sharp images.

Citta conceptualized 8-level vestigial side-band (8-VSB) transmission that made the over-the-air terrestrial broadcast system the standard in North America and several other countries. As lead project engineer he was chief architect of system design and key developer in all the fundamental patents. The lack of interference with analog channels in the "spectrum compatible" 8-VSB system allowed the Federal Communications Commission to

implement a 10-year transition from analog to HDTV. VSB transmission has also significantly reduced energy consumption and freed up spectrum for new wireless services and enhanced public security.

Colleagues describe Citta as "the best in the engineering field" and a true educator and mentor who encouraged his team to think outside the box. He holds more than 100 patents and has received numerous honors for his work, including Zenith's Robert Adler Technical Excellence Award and the IEEE 2006 Masaru Ibuka Consumer Electronics Award. In 1997 his team received an Engineering Emmy from the Academy of Television Arts and Sciences. Citta is now a private consultant working on concepts to advance digital TV for use in rapidly moving vehicles and small handheld devices.



The Integrator

UNIVERSITY OF WASHINGTON
 COLLEGE of ENGINEERING
 A Community of Innovators



Smart Grid & Clean Energy Technology

WSU/UW Project Receives \$4.3M to Develop Pacific NW Training Program

Researchers from UW along with Washington State University and industry organizations around the Pacific Northwest will join forces to establish a Training Center in Electric Power Engineering to educate the engineering workforce in clean energy and smart grids. This three-year project was selected for funding in the amount of \$4.3 million, with \$2.5 million awarded by the Department of Energy, and the remaining amount

from industry matching. Professor Anjan Bose from WSU and Professor Mohamed El-Sharkawi from UW will lead the center activities.

“UW EE’s involvement on this project provides the unique opportunity to have a positive and long-lasting impact in the area of smart grids and renewable energy,” said Leung Tsang, professor and chair. “Not only does this put us on the map as leaders in this field, but it also allows us to produce high-caliber engineers for industry.” To fully prepare the existing and future smart grid workforce, UW and WSU will revamp existing courses and add new courses that will be novel in both content and delivery mechanism. A set of modular courses—six undergraduate courses and 12 graduate courses will be developed. As a result, existing degrees specializing in power engineering will be strengthened, and an undergraduate certificate, four graduate level certificates, and a Professional MS will become viable options for students.

Courseware will also be available in a distance learning format so that people in industry will have a more convenient method to access this training.

“The EE programs at UW and WSU have a strong symbiotic relationship with the power industry in the region, with industry providing guidance and support to the universities, and the universities providing trained employees and research to industry,” said El-Sharkawi. Selection of course content will be made by an advisory team from the two universities and industry that will define the skills needed in the workforce. The unique and special facilities found at Northwest organizations such as BPA, PNNL, Areva T&D and Incremental Systems will also be integrated into the training courseware.

In addition to the resources of the two universities and industry collaborators, UW and WSU are the only two universities involved in the Northwest Smart Grid Demonstration Project, which will

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Message from the Chair

I'm delighted to share with you some good news—our department has seen a sharp increase in grant funding. To date, grant funding is already up 17% this fiscal year compared to this time last fiscal year. Most recently, the US Department of Energy has provided \$2.5 million for a joint

WSU/UW training program for clean energy and smart grid engineering. As noted in the cover story of this issue, the project will set up a joint WSU-UW Northwest Workforce Training Center in Electric Power Engineering.

Over the last few months, many of our faculty, students, and alumni have garnered several awards and honors. Professor Scott Hauck received the UW Distinguished Teaching Award for his dedication, commitment, and passion for students; nominators described these qualities as “a strong indication of his character as an educator.” Alumnus Richard Citta (MSEE '71) will be honored with College of Engineering's Diamond Award next month for his distinguished achievement in industry. Citta's conceptualization of the 8-VSB played a critical role in pioneering HDTV. And, our students continue to receive various best paper and presentation awards as well as scholarships and fellowships, which you can read more about on page 7.

Finally, we have a great commencement speaker lined up. Gary Swofford (BSEE '68) will address EE's graduating students on Friday, June 11, 2010 at 7 pm in Kane Hall 130. With over 35 years of experience in the energy industry, Swofford thoroughly understands the issues driving power utilities to adopt networking technologies. I'm positive that his insight will leave a long-lasting impression on our future engineers as they enter the workforce to make their own impact on the field.

Leung Tsang
Professor and Chair

Swofford To Speak at EE Commencement

Gary Swofford (BSEE '68), general manager of Swofford Energy Consulting, LLC, and the former senior vice president and chief operating officer for Puget Sound Energy, will deliver EE's commencement address on Friday, June 11, 2010 at 7:00 p.m. in Kane Hall 130. With over 35 years of experience in the energy industry, Swofford brings a deep understanding of the issues driving power utilities to adopt networking technologies. He provides insight into what motivates consumers and the regulatory world to embrace advanced metering programs that encourage consumers to use energy more efficiently and cost effectively.



While at Puget Sound Energy, which serves 1.5 million electric and gas customers in Western Washington, Swofford was instrumental in implementing one of the USA's first large-scale, fixed wireless networks for a utility. He also directed the operational aspects of several innovative customer service programs including a voluntary time-of-use pilot pricing program that resulted in more efficient operations and dramatically improved consumer energy consumption habits.

Swofford continues to be active in the utility industry since retiring in late 2003. He serves on the board of Tantalus, a smart grid technology company, he provides guidance to companies in the emerging technology sector, and is involved in several prominent national power organizations including the Electric Power Research Institute.

Faculty Accolades

Scott Hauck
UW 2010 Distinguished Teaching Award

Lih Lin
IEEE Fellow

Georg Seelig
NSF CAREER Award

Smart Grids

(Continued from page 1)

provide additional opportunities to bring the latest technologies into the classroom. To read about the UW campus smart-grid project, visit:

www.uwnews.org/uweek/article.aspx?id=55082

Next-Generation Smart Grid Devices

While current technology is being set up on the UW campus as part of the Northwest Smart Grid Demonstration Project, researchers are actively working on the next generation of smart grid applications. Over the last four years, assistant professor Shwetak Patel has been developing easily installed devices that use electrical noise to measure consumption in real-time down to the level of a single outlet.



Photo by Mary Levin

Shwetak Patel (right) and doctoral student Sidhant Gupta (left) discuss a prototype that can monitor electricity down to the level of the individual outlet. The device could be part of a smart-grid system giving users real-time data about their energy consumption.

A growing number of gadgets can measure electricity consumption, but Patel's system is unique because it does not require an electrician to install it. Instead, it consists of a single, low-cost device that can be attached to the outside of a residential fuse box to record electrical activity throughout the home. Studies show that better informed consumers use less energy. Patel envisions that eventually users will be able to log in to a password-protected website to see how much electricity they are consuming.

So far, the electric-sensing device has been field-tested in a few dozen homes. Patel's group hopes to piggyback on the campus pilot project to do more user tests. "This demonstration project could enable us to answer some questions faster than we could by deploying them in a number of homes in Seattle," Patel said. "We can iterate on designs and engage with people faster when they're here on campus."

2010 EE Leadership Seminar Series

During winter quarter, students had the opportunity to hear from leading executives from diverse companies who all have 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 gives our students exclusive access to leading professionals in an array of disciplines. This year's alumni speakers at the EE Leadership Seminar Series included:

Keith Rattie, BSEE '76

Chairman, President & CEO, *Questar Corporation*

Carl Morgan, MSEE '76

Co-founder & first general manager, *Heartstream (now Philips Medical Systems)*

Marnie Mar, BSEE '81, MBA '83

Client Executive, *IBM Microelectronics*

John McDonald, BSEE '90

Vice President of Marketing & Sales, *Silego*

David Leaver, BSEE '65

Senior Vice President, *WorleyParsons Polestar, Inc.*

Jens Quistgaard, MSEE '86, PhD '90

President & General Manager, *Medicis Technologies Corporation*

Dino Vendetti, MSEE '93

General Partner, *Formative Ventures*

Brian Otis, BSEE '99

Assistant Professor, *UW EE*

A Winding Road Leads Sheila Reynolds to the Frontiers of Biotech Research

Sheila Moore Reynolds took a graduate-level EE course at UW in 2001 to test the waters for possible application to a doctoral program. Pregnant with her second child, and wearing clothes sprinkled with glitter from her toddler's daycare craft activities, she felt out of place. Associate professor Jeff Bilmes remembers other things — a woman with an exceptionally creative mind who asked great questions, offered novel solutions to problems, and scored the top grade in his signal processing class. But another two years passed before Reynolds could carve out enough time in her life to enroll as a full-time doctoral student.

Soft spoken and charmingly modest, Reynolds gives no external signs of engineering geek or type A overdrive. Her route through academia and into a promising research career didn't follow the usual straight-line path, but meandered along byways leading to chance opportunities. Even her entry into the world was unusual, as she was born in the Belgian Congo during a post-independence rebellion that prompted evacuation of her family when she was just a few days old. She mostly grew up overseas as her diplomat father was posted from Korea to the Ivory Coast and Italy, where she attended high school.

The subject she always loved most was math. "When I was 5 years old I wanted to be a banker when I grew up so I could add numbers all day long," she recalled. By high school Reynolds appreciated math for its clarity and right or wrong answers. Ironically, a fortuitous mistake in filling out the wrong application form put her in the engineering college at the University

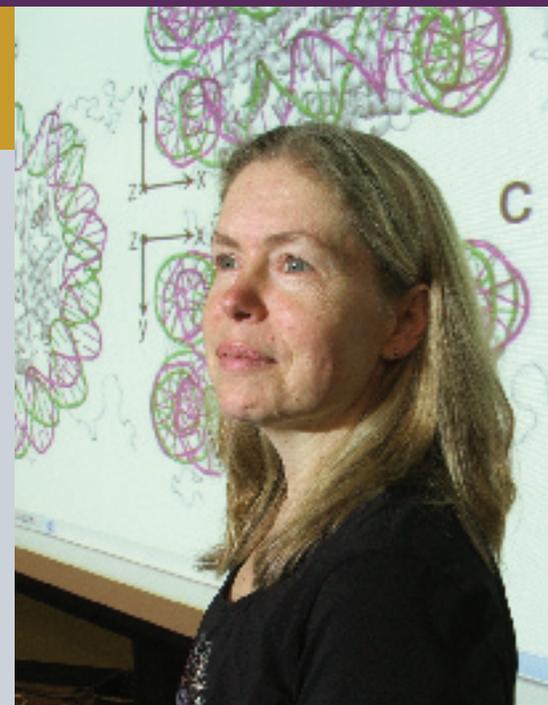
of Virginia, where she majored in EE.

"I discovered that I enjoyed signal processing because it was basically applied math," Reynolds said. After graduating in 1986 she worked for six years at a technology applications company in Virginia and also earned her MSEE in an evening program. A few years later she and her husband, a software engineer, moved to San Diego to take positions at Qualcomm, where they worked nonstop for nearly three years and barely had time to enjoy the paradise-like weather.

North to Seattle

A colleague there started a wireless company in Seattle and invited them to join him. "We thought it would be exciting to work at a startup and get rich," Reynolds laughed. Although they didn't expand their bank account, their family grew with the arrival of daughter Amelia, now 11. Reynolds quit her position to focus on motherhood, but eventually her husband suggested she go back to school — hence the trial UW course. The birth of her son, Sean, put those plans on hold.

By autumn 2003 her husband was working from home for a new startup and able to take on more child-care duties, offering Reynolds the chance to enter the EE doctoral program. Still enthused with speech and signal processing, she worked in Jeff Bilmes' lab, but explored other areas too. She overheard some students talking about an elective in computational biology, and thought that sounded cool. "The mathematical concepts were all familiar and the new application area really got me excited," she said. That set her on a path exploring the application of



signal processing methods to pattern recognition problems in genome analysis.

Still, the graduate school grind combined with raising children was exceptionally tough. "Every once in a while I'd go talk to Eve Riskin (EE professor and CoE associate dean for academic affairs), and she would pep me up," Reynolds said. At one particularly low point in 2007, though, she decided to quit school.

"I felt like a lousy graduate student and a lousy mom, but I couldn't face Jeff, so I sent him an email with the news, saying 'I'm sorry I've wasted your time,'" Reynolds said. "I thought he would agree and also that my daughter, then age 9, would be happy to spend more time with me, but she said the most amazing thing — that I shouldn't quit because I'd already worked so hard. Jeff and Bill Noble also told me they had no doubt I could do it."

Fortunately for all, she did. Several years earlier Reynolds had introduced Bilmes to Bill Noble, associate professor in the Genome Sciences department, who became her second dissertation advisor. The two eventually launched a major research col-

laboration uniting speech and language analysis technologies with bioinformatics to develop graphical models for analyzing peptides. They won a multi-million-dollar National Institutes of Health grant for research that could lead to early identification of disease susceptibility and potentially to new drugs for prevention and treatment.

“Sheila’s interests brought us together and prompted this collaboration between EE and Genome Sciences,” Bilmes said. “It’s exciting research that should keep us busy for another 10 to 20 years. Sheila’s insights have been incredibly useful and she has come up with many ideas for research directions.”

Reynolds graduated in December and will go through the hooding ceremony in

June, but finds it hard to put into words just how much that means to her. She sometimes still thinks “Who me?” when she receives an email addressed to Dr. Reynolds.

She now holds a postdoctoral position at the Institute for Systems Biology not far from the UW in the Fremont neighborhood. Founded by the famed Leroy Hood, ISB analyzes genomes and the complex interactions of genes, proteins, and biological pathways causing disease and ranks first in the US and third in the world in number citations for its research papers — a mark of significant impact.

At ISB Reynolds is working on a huge National Institutes of Health, multi-center project to create an atlas of the

cancer genome. It involves analyzing genetic data from the tumors of thousands of cancer patients to determine not just mutations, but to analyze disease from a whole systems perspective.

“Long before I started down this particular research path, my father passed away from cancer, so doing this research is especially meaningful to me,” Reynolds said. “I love working at ISB and hope to get a permanent position when my post-doc ends.”

This unassuming, almost accidental engineer–scientist has her feet firmly on the ground, but surely looks like a rising star to those around her. “Sheila is so creative and comes up with so many novel ideas that I expect to see her do great work,” Bilmes said.

Generous Gifts Expand Support for the Department

2nd Annual All-College Scholar-Donor Luncheon

Nearly 200 donors, students, faculty, and staff participated in the Second Annual College of Engineering Scholar & Donor Recognition Luncheon at the UW Don James Center on November 10, 2009. The event connected donors with the recipients of scholarships, fellowships, awards, and other student support funding throughout the college. Donors, including EE graduates Rob Shanafelt (BSEE '67) and John Coltart (BSEE '67), and Patricia Hsu (at left in photo below), the wife of late Professor Chih-Chi Hsu, enjoyed the opportunity to interact with the students who benefit from their gifts.



Leonore Kerkof Scholarship

A new scholarship in memory of Leonore Kerkof will provide financial assistance to undergraduate students in the EE department. This endowment was established by a generous gift from Leonore Kerkof, the late wife of Vincent Kerkof (BSEE '49). Leonore and Vincent were married 45 years, and she wished to establish this scholarship to convey her gratitude for the education Vincent received at the UW.

Don and Joan Baker Fellowship

Don Baker (BSEE '60), and his wife Joan, have established the Don and Joan Baker Endowed Fellowship. Don was a professor in the EE department, who together with Robert Rushmer and others, pioneered biomedical engineering. This generous gift will support graduate students in Bioengineering or Electrical Engineering who are pursuing biomedical instrumentation.

Additional Support for EE Operations

The Kenneth J. and Sylvia K. Steen Endowed Fund, a new fund created in memory of Kenneth J. Steen (MSEE '72), will provide discretionary support for both the EE Department and the Foster School of Business.

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

Chris McKinley, MSEE '09

Tucson, AZ – Obtaining the MSEE made a big difference in McKinley's employability. Although he had an engineering job, he leveraged his experience and education for a more satisfying position. McKinley says that he would definitely do it again; the electrical engineering professors prepared him for new opportunities available post-MSEE.

David Sandhu, BSEE '09

Pasadena, TX – Sandhu is working in Israel as a field engineer for a Raytheon radar system, AN/TPY-2.

Miodrag (Miki) Vujkovic, PhD '06

Mountain View, CA – Upon graduation, Vujkovic has been working for the leading graphic chip company, Nvidia on the GPU notebook low-power team. One of his favorite places to live in Silicon Valley is Mountain View, where he and his spouse Jovanka (also UWEE PhD graduate) bought a beautiful townhome in December 2008. They have a wonderful son Lazar, who is now 2.5 years old. Since moving to the Bay Area, Vujkovic has visited Seattle twice and plans to come again in 2010. UW, Seattle, and the Pacific Northwest will always be in his heart and they will continue to come back.

Allan Yeung, MSEE '03

Seattle, WA – Yeung works on building the next great Windows phone on the hardware team that creates phone development platforms and demo phones. His job allows him to work on customer engagement with OEM partners in Asia, while still solving technical challenges with design teams in Redmond. The UW has set Yeung up with the right tools and network to be successful, and the attitude of continual learning and “can do” attitude. Yeung still lives in Tacoma, and ventures up to the UW quite often.

Michael Khbeis, BSEE '01

Severn, MD – Khbeis lives and works in Washington D.C. while wrapping up his PhD at Maryland. He is married and has a little girl who blissfully consumes his spare time.

Alumni Accolades

Paul Ampadu, MSEE '99

NSF CAREER Award
Black Engineer of the Year Award
University of Rochester

Shira Broschat, PhD '88

IEEE Fellow
Washington State University

Lisa Anderson, MSEE '06, David Burnett & Harvey Ho, MSEE '07

Outstanding Recruiter Awards
Sandia Labs

Paul Packan, BSEE '84

Intel Fellow, Technology & Manufacturing Group, and Director of Transistor Technology Development
One of the highest levels of technical achievement within the company

Going Green

In an effort to reduce our impact on the environment and cut costs, we will be limiting what we print by transitioning to an online version of *The Integrator*. By sending in your updated email address, you will help us with this cause. Here are some great ways you can stay in touch with the department:

Alumni Connections Form Send your contact information to receive an online version of *The Integrator*. We will not share your information outside of the UW community: www.ee.washington.edu/people/alumni/alumni_info.html

Website Stay informed about news and events by visiting our website: www.ee.washington.edu

Facebook Become a fan, find friends, and stay on top of what's going on across the college on our new Facebook page: www.facebook.com/ee.washington

Students Receive Pride@Boeing Award

On December 10th, 2009, graduate students Sidharth Nabar and Tony Wu of EE's Network Security Lab (NSL) received the Pride@Boeing award for their technology transition demonstration. The Pride@Boeing Award recognizes exceptional performance at Boeing, and was presented to "show Boeing's appreciation for the special effort and high impact contributions" that NSL put forth on the Integrated Defense Systems (IDS) Analysis, Modeling, Simulation, and Experimentation (AMSE) project for the Simulation of Security of Computer/Communication Networks Against Information Warfare Attacks.

"This award is a strong indicator of the exceptional quality of graduate students that we have here in EE," says Professor Radha Poovendran. NSL and Boeing Research and Technology have had a successful history of collaboration on multiple areas related to defense and commercial aviation. This specific effort was initiated as a technology transition of a multi-year basic research technology developed at NSL by Dr. Cliff Wang of ARO during a site visit to UW. "The project exemplifies how an advanced research topic can benefit by university-government-industry collaboration," says Poovendran.



Senior Program Manager of Boeing IA Dr. Nick Multari, Dr. Krishna Sampigethaya, Dr. Claudiu Danilov, Mr. Jeff Abrenholz, Dr. Tom Henderson, Mr. Sidharth Nabar of NSL, Professor Radha Poovendran, Boeing Senior Technical Fellow Dr. Jae Kim, Director of Boeing Networked Systems Technology Dr. Susan Ying (inset: Mr. Tony Wu of NSL).

Student Accolades

Basel Alomair, Graduate Student
IEEE & IFIP William C. Carter Award

Sina Nia Kosari, Graduate Student
Natural Sciences & Engineering Research Council of Canada Fellowship

Tim Kowalewski, Graduate Student
Best Doctoral Candidate Award, Doctoral Consortium for Medical Simulation & Robotics

Jonathan Lester, Graduate Student
Best Paper Award, International Conference on Pervasive Computing Technology & Healthcare (Pervasive Health)

Cezanne Camacho, Nomin Oyunerdene, Eric Josberger, Alexander Spott, Brendan Trimboli, Undergraduate Students
Mary Gates Scholarship Award Winners

What's the Buzz?

Students Win Design Contest



A team from Professor Brian Otis' Wireless Sensing Lab has been named a winner at the 2010 Design Automation Conference (DAC)/International Solid-State Circuits Conference (ISSCC) Design Competition. Their entry, titled "The Bumblebee: A 0.3 gram, 560uW, 0.1cm³ Wireless Biosignal Interface with 10-m Range," was authored by Tim Morrison, Helen Zhang, Shailesh Rai, Jagdish Pandey, Jeremy Holleman, and Brian Otis. The Bumblebee design was featured at the ISSCC in San Francisco in February, and again at an awards ceremony at the Design Automation Conference in Anaheim, Calif., in June.