



The Integrator

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Keith and Nancy Rattie Endowed Fellowship Offers Support for Power Systems Students

Graduate students in the Department of Electrical Engineering have a new opportunity for fellowship support thanks to the generosity of Keith (BSEE '76) and Nancy Rattie. Motivated by a lifelong interest in energy, the Rattie's have established the Keith and Nancy Rattie Endowed Fellowship to support students in the Power Systems Group. This gift is significant for electrical engineering students as it plays a critical role in response to students' increased need for support as tuition costs rise at the UW.

"Establishing fellowship endowments enable the department to recruit and retain top-notch students," says professor and chair Vikram Jandhyala. "But more importantly, fellowships such as the one established by Keith and Nancy Rattie provide students the financial resources that enable them to focus on their coursework and research."



Rattie faced similar struggles as an undergraduate student in the 70s. He was the recipient of a scholarship provided by Standard Oil and in a serendipitous way, the scholarship led him to be recruited and hired into his first job with the company. Thus began a long and successful career in the field of energy. Rattie served for nearly a decade as CEO and Chairman of Questar Corp. He currently serves as Chairman of both Questar and QEP Resources.

One of the grand challenges facing humankind is the struggle to meet the demands for energy for a planet that may be supporting nine billion people by 2050. While electricity is the commodity that makes much of modern life possible, more than one-fourth of the world's population exists without it. The Rattie's endowed fellowship will provide the department long-term research support that hopefully results in the development and deployment of technology-based solutions to the power needs of the 21st century. 

Message from the Chair



Last quarter, members of the department had the privilege of helping make 11 year-old Alex's unique wish come true—to see robots in action helping humanity. Sponsored by the Make-A-Wish foundation, EE's Biorobotics Lab and Sensor Systems Lab were honored to play a part in the elaborate two-day wish experience. Part of Alex's wish experience included a tour of these labs where he was able to see how UW EE is actually making his wish a reality!

Spring quarter commenced with Professor Ingrid Daubechies delivering our Annual Dean W. Lytle Electrical Engineering Lecture Series. Daubechies delivered an interesting lecture to a packed house in the Paul Allen Center on how historical paintings could be analyzed using the mathematical tool of wavelets. We were honored to have her as our distinguished Lytle lecturer this year.

The cover story of this issue reports on an exciting new fellowship opportunity for EE graduate students in the power systems area through the generosity of Keith (BSEE '76) and Nancy Rattie. This gift is significant for EE as it plays a critical role in recruiting, retaining and educating high-quality students at a time of increasing tuition costs.

And finally, our 2012 graduation speaker will be Dr. Andrew T. Yang. In the '90s, he was a tenured EE faculty member recognized as a National Science Foundation Young Investigator. After leaving the University, he has distinguished himself as a serial entrepreneur, lead investor, and senior advisor for a group of successful technology companies. We are honored to have Dr. Yang return to campus and share his story with members of the class of 2012 and their families.

Vikram Jandhyala
Professor and Chair

Modern Inventor of Wavelets Delivers 2012 Lytle Lecture

On April 9th and 10th, Ingrid Daubechies, James B. Duke Professor of Mathematics at Duke University, spoke to a packed house as she delivered the fourth annual Dean Lytle Electrical Engineering Endowed Lecture Series.



Her research program focuses on the analysis of signals and inverse problems in a wide range of settings, with applications ranging from fMRI and geophysics to paleontology and the study of fine art paintings. Until the end of 2010, she was a professor in the Mathematics Department and in the Program for Applied and Computational Mathematics at Princeton University.

"We were so honored to have Ingrid Daubechies as our distinguished Lytle lecturer this year," says professor and chair, Vikram Jandhyala. "People with varying backgrounds both on and off campus showed great interest in attending her lectures, which demonstrates the great impact her work has had on so many different fields."

Daubechies is best known for her work on wavelets. Some of the wavelet bases she constructed have become a household name in signal analysis; they, and computational techniques also developed by Daubechies, have been incorporated into the JPEG2000 standard for image compression. Apart from her work on wavelets, Professor Daubechies has contributed to other seminal advances in signal and image analysis and compression. "Daubechies' work is so highly influential that it is frequently referenced by researchers from a wide range of disciplines," says Professor Les Atlas. "Her book *Ten Lectures on Wavelets* has been referenced by over 17,500 research papers by others in essentially all fields in science and engineering, which is an astoundingly high number and the most I've personally seen."

Her work has been recognized by a number of awards, most notably a MacArthur Fellowship in 1992, the National Academy of Sciences Award in Mathematics in 2000, and both the Benjamin Franklin Medal for Electrical Engineering and the IEEE Jack S. Kilby Medal of the IEEE Signal Processing Society in 2011. She holds honorary doctorates and is a member of national academies in several countries; she was elected to the US National Academy of Sciences in 1998. She is presently serving a 4-year term as the President of the International Mathematical Union. **IEE**

Professor Ingrid Daubechies, Professor Les Atlas, and alumnus Louis Scharf, Professor of Colorado State University.



Event photos by Kenneth Low.

Andrew Yang to Speak at 2012 EE Graduation Celebration

Dr. Andrew T. Yang is returning to the department as the 2012 graduation speaker. His distinguished career as a tenured faculty member was marked by his recognition as a National Science Foundation Young Investigator and a member of the Chair's Circle of Excellence. Students honored his success as a teacher with the Professor of the Year award.



"When Andrew was an EE professor, he trained and supervised several PhD students who later started their own companies."

Dr. Yang has maintained a strong and supportive relationship with UW EE. Howard Chizeck, former EE chair recalls, "When I arrived at the UW in 1998, Andrew was on leave in industry. After his great success there, we discussed his possible return to the department. Although he could not be convinced to return to his role as professor, he expressed a great passion for helping students to pursue their dreams. He established the Yang Award for this purpose—to recognize outstanding researchers at a crucial stage, when the achievement of such recognition could best help them in the next step of their careers."

After his successful research and teaching career at the UW, he became a celebrated serial entrepreneur, lead investor, and senior advisor for a group of successful technology companies. He founded Anagram, currently serves as president of Apache Design of which he is co-founder, and he is the general manager of Ansys.

Professor Emeritus Greg Zick, the department chair during Andrew's tenure at UW EE, remembers Dr. Yang's entrepreneurial spirit. "Andrew Yang was a talented and driven researcher. He was able to combine his success in research with a strong sense of business to achieve success. Andrew is an excellent choice for graduation speaker as he has a wide range of experience to share with the graduating students."

Yang has continued to be a mentor and guide for the up and coming UW entrepreneurs including current chair, Vikram Jandhyala. "When I joined the UW, Andrew had already left to become a highly successful entrepreneur. When I founded a startup in 2006, I was fortunate to interact directly with Andrew and gained a deeper understanding of his influence and stature in the high-tech startup world. He is an exceptionally successful and respected technical founder and CEO. It is a great pleasure and honor that we are able to have him as our graduation speaker. He is a superb role model for researchers and technical leaders at all levels."

Former colleague and department chair, Leung Tsang recalls Yang's affinity for mentorship. He encouraged his students to innovate and design creative solutions.

The department is honored to welcome Andrew Yang as its graduation speaker and share his story with members of the class of 2012 and their families. **IEE**

RAVEN II *Takes Flight*

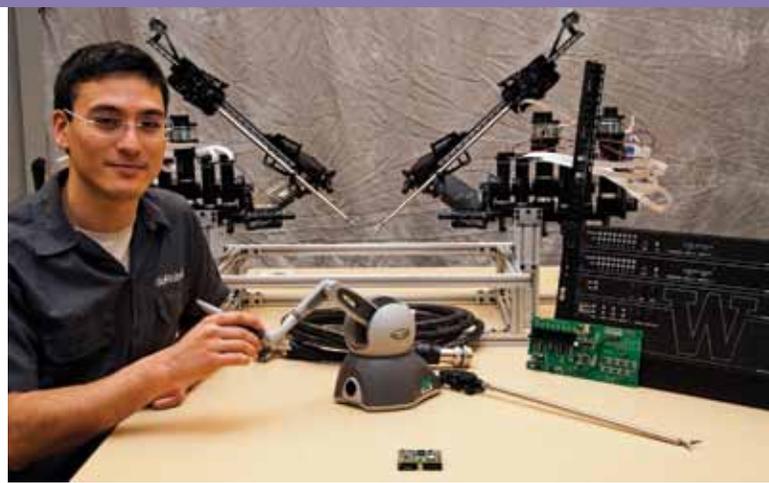
Surgical Robotic Systems Shipped to Universities across the Country

Robotic surgery systems cleverly named RAVEN II, have been shipped to Medical Research Centers across the country. Developed by researchers from the Biorobotics Lab and University of California, Santa Cruz, RAVEN II will provide the first common research platform to develop the future of surgical robotics.

“With everyone working on the same, open-source platform we can more easily share new developments and innovations,” said Professor Blake Hannaford.

In all, eight RAVEN II systems were produced through the support of the National Science Foundation; Harvard University, Johns Hopkins University, the University of Nebraska-Lincoln, the University of California, Berkeley, and the University of California, Los Angeles, the University of California, Santa Cruz, and UW each have their own yet identical system.

The latest version of the RAVEN has mechanical wrists that hold tiny pincers. Coming soon is a piece that will allow research groups to attach the same tools used by commercial surgical robots. The UW group is



making its software work with the Robot Operating System (ROS, a popular open-source robotics code), so groups can easily connect the RAVEN to other devices.

The hope is that the common, open-source platform will allow research groups to share software, replicate experiments and collaborate. All projects are aimed at speeding up procedures, reducing errors and improving patient outcomes.

Four more universities are already in line to get the system. After an upgrade to RAVEN II features, the original Raven robot (built at the UW in 2005) will move to UW Medicine’s Institute for Simulation and Interprofessional Studies (ISIS) for use by medical researchers there.

Mission Possible: Robot Protocol UW EE Robots Play a Part in 11yr-old’s Wish Experience

The Make-A-Wish Foundation and several organizations across the greater Seattle region participated in an elaborate wish experience called “Mission Possible: Robot Protocol” for 11-year old, Alex of Olympia, Wash.

The EE department was one of the locations for the secret mission of Alex, whose wish involved robots for peace. Alex visited Professor Howard Chizeck and his graduate students in the Biorobotics Lab, where he had an opportunity to “touch” remote objects using a haptic rendering system and an Xbox connect camera system. Then he explored Professor Josh Smith’s lab, where he had a chance to interact with and operate a mobile robot. After visiting EE, Alex and his family went to Red Square, where there was a surprise flash mob of 1500-2000 people. This included the UW Dance team, and a large number of people in robot and Star Wars costumes. The entire event was organized by the Make-A-Wish foundation. | 



Top row and photo above by Eric Rust Photography.

UW EE History Woven into Mystery Novel – A *Spark* of Death

It's the spring of 1901, and a UW EE professor lies dead in Denny Hall, found inside a mysterious contraption built as part of a student exhibition. Professor Bradshaw discovers the body and becomes both the prime suspect and the lead investigator trying to solve the case.

A Spark of Death, written by UW Bothell graduate Bernadette Pajer, is the first installment of the Professor Bradshaw Mystery Series. The plot is set more than a century ago on the UW campus, and though the story is fictional, the details of the setting, the time period and the technology are real. Here are some interesting fact and fictional items found in the book. The second book in the series, Fatal Induction, will be released in May, and takes place in the fall of 1901. As the series progresses, Bradshaw will keep his day job as a UW EE professor, but he will continue to solve mysteries. For more information about the Professor Bradshaw Mystery Series, visit:

<http://bernadettepajer.com/>

FACT: The UW had an engineering department and EE courses were offered in 1901, but EE did not become its' own department until 1905. Parker Rowell received the first BSEE degree in 1902.

FACT: The action takes place at what used to be called the UW's Administration Building (the first EE Laboratory was in the basement of this building), which is now known as Denny Hall.

FICTION: The characters of this mystery novel are fictional.

FACT: EE students put on a terrific electrical exhibition in May of 1901 that was open to the public. According to the *Seattle Daily Times* of May 18, 1901, Professor Doubt gave "an hour in a lecture on wireless telegraphy and colored photography...then followed an adjournment to the basement of the building where an elaborate program of experiments were performed by the students, all of whom showed a remarkable dexterity in handling the subtle and mysterious electric fluid."

FACT: A Tesla coil was displayed at the electrical exhibition, though not nearly as large as in the book.

FICTION: President William McKinley was scheduled to visit Seattle, but it did not coincide with the exhibition held on May 18, 1901.

FICTION: Page 69 mentions a GE-Stanley outdoor transmission transformer called "Big Stan." This is not listed in the lab equipment in the UW Catalogue for 1900-1901; its placement is fictional and serves the plot by providing a possible source of lethal current. For practical lessons on transmission equipment, students would have gone to the power house.

FACT: On page 125, Professor Bradshaw tells Missouri Fremont she can afford to attend the UW because it's free. This is fact! In the UW Catalogue for 1900-1901, "instruction in the University of Washington is free to all, without regard to race, sex, creed, or social station." There were a few small lab fees. Engineering students paid a \$5 deposit, and they were refunded any money left at the end of the year.



In Memory of Edward Guilford



The department was saddened by the death of Professor Emeritus Edward Guilford on October 31, 2011 at the age of 91. Guilford received his BA and MS from the University of Utah in 1942 and 1950, and his PhD in Electrical Engineering from the University of California, Berkeley in 1959. He was hired by UW EE as an Assistant Professor the same year.

His research area was in energy conversion. After about a year and a half in the department, Guilford was promoted to Associate Professor, surprisingly fast work. He became a full professor in 1971.

In 1962, the Minuteman missile program was discontinued. Guilford obtained a Minuteman computer, modified it, and used it for several applications which greatly enhanced the educational labs and kicked off what we now see as the signal processing and machine learning research efforts in the department. In addition, he also maintained his continuing interest and participation in the later department programs on energy and energy conversion.

Many faculty fondly remember Professor Guilford's wry sense of humor. "Ed had a great sense of humor and kept my spirits up back when I was a struggling new assistant professor," says Professor Les Atlas. Professor Emerita Irene Peden recalls asking Guilford how he kept his many cactus plants looking so healthy. Guilford replied by saying that he watched the newspapers and every time it rained in Phoenix, he would water his cacti.

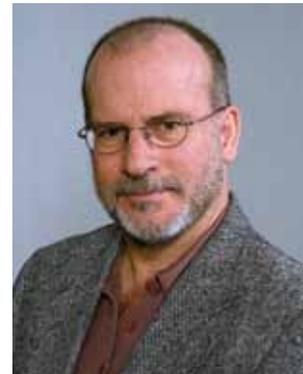
Guilford loved to describe himself as an "old curmudgeon," but in reality, he was a good faculty friend and mentor. Ed Guilford will be missed, and our thoughts are with his family. **IE**

Scholarship Established to Honor Myly Vu

SeaTec Consulting, a systems engineering consulting firm in Bellevue Wash., honored the memory of their colleague, Myly U. Vu by endowing an EE scholarship in her name. This scholarship will help students who demonstrate an interest in pursuing careers in aerospace or air transportation. Vu received her BSEE degree at the UW in 1988 where she met her husband. She went on to work for Boeing and became a Senior Systems Engineer and Business Analyst at SeaTec. She fought a long and courageous battle with cancer and passed away August 7th, 2010 at age 45. Her son is now a freshman at the UW. **IE**

Atlas Wins Bloedel Scholar Award

The Virginia Merrill Bloedel Hearing Research Center expresses its emphasis on multi-disciplinary collaboration through the Bloedel Scholar's award, which enables the winner to focus on research for a three-year period.



This year's winner is Professor Les Atlas. While underscoring the Center's collaborative focus, this choice is also the story of one man's lifetime fascination with sound and a race to contribute to research that could help those with hearing complications.

A talent for electronics and a love of music led Atlas to an earlier career in guitar amplifier innovation, with clientele that included some legendary professional guitarists. When his push to design a more powerful guitar amplifier led to what Atlas calls "a surprising and expensive explosion of electronic parts," he enrolled in an electrical engineering program. "My approach was lacking in depth," he admitted. Fascinated by how we hear sound wave variations, Atlas has devoted his career to understanding these important variations and how our natural auditory processing can be enhanced by computers.

*Now this music lover and scientist faces his own hearing loss. "We need breakthroughs in this field," said Atlas. "The Bloedel award is a huge help and a validation." **IE***

2012 EE Leadership Seminar Series

The EE Leadership Seminar Series (EE 400), now in its 7th year, is designed to demonstrate the depth and breadth of a degree in electrical engineering to current EE students. Since EE strives to involve alumni in the life of the department and provide opportunities for students and alumni to connect, this series achieves this dual goal.

EE was fortunate to have ten very successful alumni contribute their talent to this year's class. Thanks to all who took the time to come back to campus and share their industry insights with our students. We value their contribution to our students' professional development and awareness of career options. The class consistently receives high ratings on student surveys. "One of the most valuable courses I've taken here," wrote one of our undergrads.

Jerry Johnson, BSEE '76
CIO, Pacific Northwest National Laboratory, PNNL

John Brew, BSEE '82
Technical Fellow, Boeing

Ganesh Moorthy, BSEE '81
CEO, Microchip Technology, Inc.

Karen Archer Perry, BSEE '82
Senior Program Officer, Gates Foundation

Jeff Powers, PhD '80
Principal Scientist, Philips Medical Systems

Dave Deits, BSEE '69
Attorney & Partner, Davis Wright Tremaine LLP

Ted Kummert, BSEE '85
VP, Subscription Services Division, Microsoft

Jesus Torres, BSEE '05
Equipment Engineer, Boeing

Annie Vithayathil, BSEE '01, JD '09
Associate, Perkins Coie LLP

Phillip Christenson, BSEE '01, MBA '08
Director of Marketing, Data I/O

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

Patrick Tague, PhD '09

Sunnyvale, CA – Tague is a recent recipient of the NSF CAREER Award. Tague is a member of the research faculty at Carnegie Mellon Silicon Valley, and his CAREER Award is titled, "Inference-Based Adaptation Techniques for Next Generation Jamming and Anti-Jamming Capabilities."

Ryan Clemente, BSEE '11

Bakersfield, CA – Clemente is thankful to his power professors (Damborg, Christie, El-Sharkawi) for teaching him the importance of group work and process thinking for problem solving. He started his career at Oxy last January where he manages capital projects related to the electrical distribution system for his company's operations. Clemente believes his education has instilled the technical knowledge of power systems which he encounters every day from transmission lines, to substations, electronic relays, motor control centers, and motor drives.

Tianyi Ma, BSEE '12

Kenmore, WA – By working hard, Ma received the annual Dean's list award, and earned a major GPA of 3.72. Ma enjoys playing tennis and is currently playing for the 3.0 USTA league team.

In Memory of Roland August Magnuson

On January 21, 2012, Roland "Rolly" August Magnuson passed away after a brief illness. Magnuson was the youngest son of Swedish immigrants; he was born on December 10, 1921, and grew up in Burien, Wash., where he attended Highline High School and participated in Boy Scouts. Magnuson served as an officer in the Army during World War II and was stationed in Italy through 1946. In 1944, he received his BSEE from the UW. A year later, Magnuson met his wife Effie Stine, and together they raised three sons and a daughter in Burien. Magnuson enjoyed a successful engineering career at PACCAR where he became Chief Engineer and was awarded 27 design patents. He enjoyed boating, tinkering with mechanical things, plumbing, fishing, hunting, camping, skiing and gardening.



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Whether you're already working as a bachelor's level electrical engineer or want to break into a new field, the UW Professional Master's Program (PMP) may be for you. The Electrical Engineering PMP offers a work-compatible Master's degree in electrical engineering. Courses are taught by the UW's world-class Electrical Engineering faculty. Our faculty's cutting edge research informs their teaching, allowing you to bring the latest ideas to bear in your career.

The program typically takes three years to complete, with students taking one class per quarter in the evening as well as a 1-credit quarterly seminar.

Upcoming Admission Deadline:

July 1st, 2012

To learn more, visit:

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

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