COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

ELECTRONIC NEWSLETTER / OCTOBER 2010 / WWW.EE.PSU.EDU

The department recently published its first annual report. The report, which details the activity of the department for calendar year 2009, was mailed out in September. If you did not receive a copy, there are copies available in the department office. To be added to the mailing list to receive hard copies of our magazine and the annual report, please email Cathy: CLS118@psu.edu

PENN STATE LEAD ON ARMY RESEARCH LAB FUNDED RESEARCH CENTER

The U.S. Army Research Lab created the Network Science Collaborative Technology Alliance (CTA) as an interdisciplinary program bringing together government, industry, and academic institutions to perform foundational, cross-cutting research. This alliance is comprised of four research centers:

Interdisciplinary Research Center

Information Networks Academic Research Center

Social/Cognitive Networks Academic Research Center

Communication Networks Academic Research Center (CNARC)

Penn State was awarded the $35 million, ten-year grant from the U.S. Army Research Lab to establish the Communications Networks Academic Research Center (CNARC) in September 2009. Aylin Yener, professor of electrical engineering, is a project leader of CNARC. The mission of the center is to develop the "communication network science," in particular for tactical networks. Yener explains, "This is an ambitious project and a significant investment. We are working towards developing the network of the future. We are starting from the fundamental theory of communications, redefining metrics based upon which network performance would be quantified, challenging assumptions that were at the heart of communications for over sixty years. The communication network of the future will be integrated with the information network, e.g. large databases and how information moves, as well as the social network. That is why we are collaborating with the other centers in the CTA to develop network science."

Penn State has partners in the CNARC including the University of California at Davis, the University of California at Santa Cruz, University of Southern California, and the City University of New York. Several institutions also are collaborating with the center including the University of California at Riverside, North Carolina State University, Stanford University, and BBN Technologies.

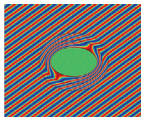
The CNARC is housed in the Networking and Security Research Center (NSRC) under the direction of Tom LaPorta. The NSRC was established at Penn State in 2003. According to the mission statement, the center "provides a research and education community at Penn State for professors, students, and collaborators from industry interested in networking and security." The NSRC's primary purpose is to draw expertise from academia and industry to collaborate on security solutions for communications networks.

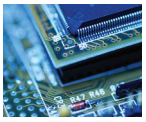
"NSRC houses a number of computer science faculty with complementary expertise to mine. This diversity has led to good interdisciplinary collaboration opportunities such as the CNARC." Yener stated. The Wireless Communication and Networking Laboratory (WCAN@PSU) of the electrical engineering department that Yener directs is one of the three affiliated laboratories in NSRC, the other two being from the computer science and engineering department. NSRC also has affiliated faculty as diverse as from Smeal College of Business and Dickinson School of Law.

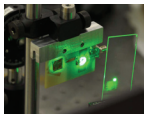
DEPARTMENT RESEARCH AREAS

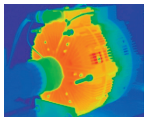

Communications and Networking


Control Systems

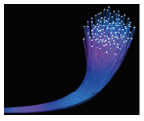

Electromagnetics


Electronic Materials and Devices


Optical Materials and Devices


Power Systems


Remote Sensing and Space Systems


Signal and Image Processing

Faculty Spotlight

Constantino Lagoa, associate professor of electrical engineering, completed his bachelor's and master's degrees in electrical and computer engineering at the Technical University of Lisbon in Portugal. His adviser recommended that Lagoa study in the United States and suggested Professor B. Ross Barmish at the University of Wisconsin as a mentor. Lagoa comments, "I believe that students should select a graduate school with an emphasis on finding an advisor whose research is in your primary interest area rather than solely based on the graduate program." Lagoa received his Ph.D. from the University of Wisconsin in 1998.

On exploring his options, Lagoa made the decision to stay in academia because of his love of teaching and research. Lagoa joined Penn State in 1998 as an assistant professor in the Control Systems area. He credits a good instructor in Portugal with honing his interest in electrical engineering. "A good instructor can make a big difference in the course of your studies and interests in college," stated Lagoa. Based on this realization, Lagoa understands his responsibility as an instructor and adviser, whether in the classroom or in the lab.

Lagoa has a wide range of research interests including robust control, controller design under risk specifications, system identification, control of computer networks, and discrete event dynamical systems. More recent projects he is involved with include working with extremely large amounts of data and using and developing tools based on control systems theory to extract actionable knowledge or information. Examples of applications of his current research include image/video processing, explosive detection, and seizure control. The National Science Foundation is the funding source for most of his research. Chao Feng, graduate student in Lagoa's research group, comments, "Dr. Lagoa is always aware of the latest developments in the research area that he is interested in. He sends the most important papers among his readings to his students and discusses it with them. Dr. Lagoa is very patient; he listens to his students and respects their ideas and opinions."

In 2000, Lagoa received the NSF CAREER award for his proposal on system design under risk constraints. Lagoa is currently a member of the IEEE Control Systems Society. He is an associate editor of the IEEE Transactions on Control Systems Technology. He has also been in the organizing committees of several conferences and workshops. He is currently a member of the Penn State Senate and he is also the signals and systems area chair in the Department of Electrical Engineering.

In his free time, Lagoa enjoys photography, hiking, and spending time with his family. Lagoa and his wife, Marta, have one daughter and live in State College.

Student Spotlight

Ibrahim Al Mulhim, a junior in electrical engineering, really enjoys the international activities provided at Penn State. Al Mulhim is from Saudi Arabia. He is being sponsored by Saudi Basic Industries Corporation (SABIC), a leading manufacturer of chemicals, fertilizers, plastics, and metals. He came to the U.S. in August 2007 and studied English at the University of Pennsylvania for one year. After researching universities, Al Mulhim decided to attend Penn State based on the academic program and cultural activities available. Al Mulhim comments, "I don't only want to study, but I also want to have activities and live and interact with different nationalities."

Al Mulhim, right, is pictured here with the CEO of SABIC

Al Mulhim became interested in electrical engineering at an early age and knew that would be his course of studies. His specialization is electronics and he plans on graduating in spring 2012. One aspect he particularly enjoys about the program is the labs and the seemingly endless amount of equipment that can be obtained from the stock room.

This summer, Al Mulhim returned to Saudia Arabia for an internship at SABIC. This was a valuable learning experience for Al Mulhim. He worked hard at understanding the work in the factory and spent extra hours familiarizing himself with the processes. Ultimately, the manager realized the potential in this young man and he was made a co-lead on a project to determine the best way to supply electricity and water to an expansion of the company. Al Mulhim stated, "It was a very overwhelming experience and I had to work hard for it. I was working 12 hours a day to finish my job." As a part of the project, he had to work with people from different nationalities. Al Mulhim believes that his experience at Penn State helped him interact with this diverse group of people.

Upon graduation, Al Mulhim will return to Saudia Arabia and work for SABIC. After several years, he would like to return to the U.S. to get an MBA from another prestigious university. Following his graduate degree, he would like to work at one of SABIC's international locations, possibly in Europe or China.

In addition to his studies, Al Mulhim is busy with a number of activities in and around campus. He is involved in several clubs and holds leadership positions. Al Mulhim and a friend recently started a consulting company called Saudi Entrepreneurs CO. They specialize in improving and upgrading the operations of small businesses and also develop software for a segmented market. Al Mulhim sums it up, "I love adventures and exploring new things."

Department Updates

Iam-Choon Khoo, W. E. Leonhard Professor of Electrical Engineering, presented the keynote invited talk at the SPIE European Symposium on Security & Defense Conference on "Optical Materials in Defense Systems Technology" in Toulouse, France, on Sept. 23. The presentation, titled "Multiple-time-scales dynamical studies of multiphoton nonlinear absorbers for passive all-optical sensor protection against agile-frequency lasers," is co-authored with his graduate students Mike Stinger, Justin Liao, Junbin Huang, and Shou Zhao, and T. E. Mallouk, Evan Pugh Professor of Chemistry. The work is supported by the Air Force Office of Scientific Research and the NSF-Material Research Science and Engineering Center at Penn State.

Kenneth Jenkins, professor and head of electrical engineering, was invited to the electrical and computer engineering department at Temple University on Sep. 3 to serve as an external participate in their annual departmental retreat. The focus of the retreat was to focus on strategies to enhance the visibility of the department to the upper administration and the external community.

Qiming Zhang, distinguished professor of electrical engineering, presented a series of invited talks in China during the month of September including: "Giant electrocaloric effect in ferroelectrics and solid state cooling devices" at the Chinese Academy of Science in Beijing, "Multifunctional Electroactive Polymer and nanocomposite" at Beijing University, "Electroactive Polymer Devices" at the Nanjing University of Aerospace Engineering, and "Electroactive Polymer and Nanocomposite Devices" at Tsinghua University.

Zhang also presented invited talks at the following in August: "Giant Electrocaloric Effect in Ferroelectrics and Solid State Cooling Devices" at Harvard University, "Multifunctional Electroactive Polymer" in Arkema France in Paris, and "Electrocaloric Effect in ferroelectric polymers" at Jozef Stefan Institute in Slovenia.

Kenji Uchino, professor of electrical engineering, is on an interdepartmental personnel agreement leave from Penn State, working in the Office of Naval Research (ONR) Global – Asia, in the Tokyo office as Associate Director under a special U.S. government assignment. Uchino is actively working in expanding the research collaborations with Asian researchers. He is an international ambassador of the chief of naval research, and sponsors three major programs: Visiting Scientists Program, Conference Support Program, and Naval International Cooperative Opportunities in Science & Technology Program.

For more information about these programs, refer to: http://www.onr.navy.mil/Science-Technology/onr-global.aspx. Uchino will be working in the ONR-Asia until June 2012. He can be reached at: kenji.uchino@onrg.navy.mil

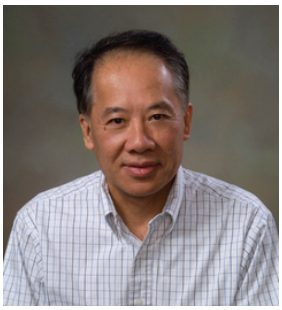
The research of Mohsen Kavehrad, W.L. Weiss Chair Professor of Electrical Engineering, is featured in a paper titled, "Optical Wireless Indoor Networks: Recent Implementation Efforts," authored by Klaus-Dieter Langer and Jelena Vuèiæ of the Fraunhofer Institute for Telecommunications. See the entire article here.

25 Years of Service

Three members of the electrical engineering department were recently honored for 25 years of service at Penn State.

Anna Kennedy, graduate admissions administrative support assistant; Iam-Choon Khoo, William E. Leonard Professor of Electrical Engineering, and Jerzy Ruzyllo, distinguished professor of electrical engineering, each received their 25-year chairs at a recent ceremony.

Kennedy started her Penn State career in the data processing department in the Department of Agricultural Economics and Rural Sociology. She held several positions within that department for the next 18 years. Kennedy joined the Department of Electrical Engineering in 2002.



Khoo is a faculty member in the optical materials and devices research area. He is an Optical Society of America fellow, IEEE fellow, and United Kingdom Institute of Physics fellow. Khoo received the Penn State Engineering Alumni Society Outstanding and Premier Research Awards.

Ruzyllo is a faculty member in the electronic materials and devices research area. He is an IEEE fellow and an Electromechanical Society fellow. He was named a distinguished visiting professor at Warsaw University and was bestowed the title of professor by the president of Poland. Ruzyllo received the Penn State Engineering Alumni Society Outstanding Research Award.

NSRC Industry Day

The Networking and Security Research Center is hosting its annual Industry Day on Oct. 24—26 at the Nittany Lion Inn on the University Park campus. This event, in its sixth year, is intended for industry and government agencies interested in obtaining more information about the networking and security landscape. Keynote speakers include Kamal Jabbour, air force senior scientist for information assurance, Air Force Research Laboratory and Dr. Robert Cunningham, group leader of the cyber systems and technology group, MIT Lincoln Laboratory. For more information or to register, please visit the NSRC Industry Day Web page: http://nsrc.cse.psu.edu/id10.html.

Football Homecoming Weekend Oct. 8-10
Join us for these events during Homecoming weekend

Society of Penn State Electrical Engineers Meeting

Society of Penn State Electrical Engineers is holding their fall meeting on Friday, 3:00 – 4:30 p.m. in 101 EE East. Items on the agenda include department update, SPSEE activities, and the mentoring program. We will also be awarding the first Early Career Recognition Alumni Award to Paul Mittan. Light refreshments will be provided. You can sign up on the department website:

http://www.ee.psu.edu/AlumniFriends/FallMeeting2010.aspx or by calling Cathy at 814-863-0253.

Homecoming Parade

The homecoming parade begins on Friday at 6:00 p.m. and is routed through campus and downtown. The College's alumni association is marching in the parade this year. They will be carrying the Penn State Engineering Alumni Society banner and will be joined by the EcoCAR. There are limited spaces available for those interested in joining the college in the parade. If interested, please email jtheiss@engr.psu.edu.

Football Tailgate

Yes, we're trying it again.

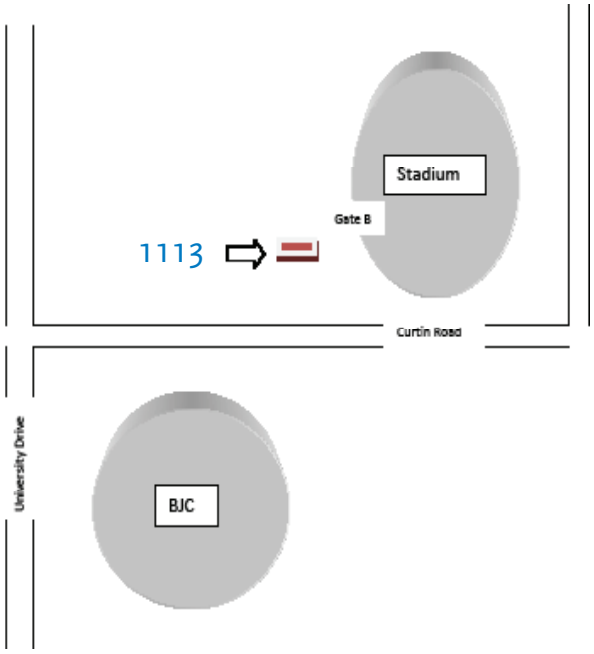
A homecoming football tailgate for electrical engineering alumni and the department will be held on Oct. 9 prior to the game with Illinois beginning at 9 a.m. Kick-off is noon. We will be located at RV parking space number 1113 which is the first row of RV's west of the stadium on the paved lot near Gate B.

Special thanks to John Wenaas (B.S., finance '69) and Wayne Breisch (B.S., electrical engineering '59) for assistance in donating this space!

Please plan to stop by. You don't have to register but it will give us an idea of how many people to expect. You can sign up on our website: http://www.ee.psu.edu/AlumniFriends/default.aspx or by calling Cathy at 814-863-0253.

Join us for an exciting homecoming weekend!

Map to the homecoming tailgate:



Alumni News and Information

If was very exciting to see the number of alumni volunteers we received for the mentoring program. This is our first year in the program and we will be fine tuning throughout the year. Mentors, please be sure to contact your student regularly.

Mentoring isn't the only way for alumni to be involved. Please refer to the alumni page of the website for more opportunities or contact Cathy at 814-863-0253 or CLS118@psu.edu

Have alumni news to share? Please forward it. I love pictures too!

Contact Information:

Department of Electrical Engineering, 121 Electrical Engineering East, University Park, PA 16802, Phone: 814-865-7667, FAX: 814-865-7065

Web: www.ee.psu.edu

Please submit news items to: Cathy McClellan at **cls118@psu.edu**