

EE CIRCUIT BOARD

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Fall 2014 **Editor: Shey Peterson**

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GREETINGS FROM JIANN-SHIOU YANG, PROFESSOR AND HEAD

It is the time of the year for me to update you on the recent exciting events happening in the department.



The EE Department continues to provide students with a high quality of education and outreach opportunities, and extends the breadth and depth of the research activities consistent with our faculty expertise. I am very proud of the accomplishments of our faculty and students this past year. It is my pleasure to highlight some of the activities we have made since Fall 2013. I hope you enjoy reading this newsletter.

Dr. Desineni Subbaram Naidu joined the EE faculty in Fall 2014 as the Minnesota Power (MP) Jack Rowe Chair Professor to replace Dr. Marian Stachowicz who retired in January 2014 after serving on the faculty for twenty-two years. Dr. Naidu received his M.S. and Ph.D. degrees from the Indian Institute of Technology (IIT), Kharagpur, India. Before joining the department, he was Professor and Director of Measurement and Control Engineering Research Center (MCERC) at Idaho State University, Pocatello. Dr. Naidu is teaching EE 5151 "Digital Control System Design" this Fall semester and will develop a new course for us in the power/energy area. In addition, he will work with industry to develop quality research and outreach programs. I would also like to welcome Dr. Khai Le who joined the EE Department as Visiting Postdoctoral Associate under the supervision of Dr. Jing Bai. He will with us during the 2014-15 academic year. Dr. Le received his Ph.D. degree from Ghent University, Belgium in 2011 and is teaching a special topic course EE 5995 "Nanophotonics" this semester. I am very pleased to welcome both Drs. Naidu and Le to join the department. Two faculty members Dr. Jing Bai and Dr. Hua Tang are returning to the department after their leave for the previous academic year. Dr. Bai will serve as the Director of Graduate Studies (DGS) for our MS graduate program. Two course proposals, submitted by Mr. Tom Ferguson and Dr. Mohammed Hasan, have recently been approved by the SCSE Curriculum Committee and will become effective in Spring 2015. They are: EE 5470 "Antennas and Transmission Lines Laboratory" (1 credit) and EE 4899 "Co-Op in Electrical Engineering" (1-3 credits). After serving as the EE Office Support Assistant for four and a half year, Sarah Wilfahrt resigned from her position and moved to California. Sandy Meitts from SCSE will chair the Search Committee with Shey Peterson (EE) and Jeanne Peterson (Physics) as the committee members. This will be a joint position serving both departments with changed job duties.

This past summer the EE Department hosted four summer camps for middle school 6th – 8th grades. Two "Electric Magic!" summer camps, each one-week long, were for boys and girls separately. The other two "E-Fun!" camps, a joint effort with Civil Engineering and Mechanical Engineering, were also organized as two separate groups one for boys and one for girls. We received very positive comments from students and their parents. This is the 2nd time we hosted such an event. Thanks go to Dr. Chris Carroll, Mr. Xiaogang Chen, Mr. Scott Norr, Ms. Shey Peterson and several of our student volunteers. It was a great success!

The EE Department is now in preparation for the upcoming ABET re-accreditation in Fall 2015. Both accredited EE and ECE programs run concurrently through September 30, 2016, and that is the end of the current ABET accreditation cycle. Starting Fall semester of 2016, ECE will be dropped and EE will become the sole program. Currently, we have 23 students in the ECE program and they all should be able to graduate before Summer 2016. We are now working on assessment and self study documents in preparation for a Fall 2015 ABET visit. This accreditation effort will involve our faculty, students, members of the EE Industrial Advisory Board, and other private and public sector

employers. Dr. Stan Burns will chair the departmental ABET Committee with the committee members Mr. Scott Norr and myself. One of the Associate Deans, Dr. Richard Maclin, is coordinating the ABET re-accreditation effort for the SCSE engineering programs and Computer Science where Stan and I are also serving on the SCSE ABET Committee. Thanks go to Mr. Tom Donofilo from Minnesota Power for helping me review the ECE/EE scholarship applications this past summer. Twelve scholarship recipients were awarded scholarships at the SCSE Engineering & Industry Banquet on October 20th.

Our ECE and EE graduate placement rates have always been high. The most recent 2012-2013 graduate follow-up statistics data from the UMD Career Services show that the placement rate for ECE and EE was 97% and 100%, respectively, with 77% and 88% of our graduates employed in Minnesota. The median starting salary for our graduates was always on one of the highest on the campus.

Please stay connected with the Department and consider sharing your personal success story with us. Jot us a quick note and let us know what's happening by sending your information to the Department via e-mail (umdee@d.umn.edu) or snail-mail. Again, I look forward to connecting with you in our next newsletter.

UPDATE FROM ASSISTANT PROF. JING BAI



Dr. Jing Bai has been working on several research topics on nanophotonic devices for applications on environmental control, medical diagnosis and renewable energy. Her recent research activities are sponsored by the National Science Foundation (NSF), MnDrive Initiatives from the University of Minnesota and the White Institute for Clinical Research. She was invited to serve on review panels of NSF (USA) in February 2014 and Swiss National Science Foundation (SNSF) in July, 2014. Dr. Jing Bai resumed her duty as the Director of Graduate Studies (DGS) in EE department from Summer 2014**.**

UPDATE FROM PROF. STAN BURNS



Dr. Stan Burns is a member of the State of Minnesota FIRST Robotics Planning Committee. UMD will host the regional kickoff event for the FIRST Robotics competition on 3 January 2015. Over 20 schools are expected to participate. The Lake Superior Regional will be held February 26-28 at the DECC with up 120 schools participating. March 2014, we had close to 120 schools participate, which makes the local tourism folks very happy. The DECC is now at capacity for this event which is one of the largest in the country.

Dr. Stan Burns continues to teach EE 1001, Intro to Electrical Engineering and both the lecture and laboratory sections of EE 2212, Electronics I. He is also teaching EE 4611 which is the revised upper-level course in Semiconductors. The topics in EE 4611 map onto his past research activities at the Iowa State University Microelectron Research Center and current research activities. He served as the Director of Graduate Studies this past year as well as Graduate Seminar Coordinator. He is the EE Representative to the SCSE Executive Committee and the SCSE ABET Accreditation Committee.

The EE 1001 class includes presentations by our faculty and topics on professional development and engineering ethics as well as very informative and motivational presentations by external speakers from industry. He would like to thank Andrew Remus from Minnesota Power, Dean Klein from Micron Technology in Boise, Bruce Howell from Cirrus Design, Keith Erickson and Mark Chmielewski from Saturn Systems, Mat Jonson and Grant Sims from GeaCom and Greg Carpenter and Dan Landherr from Boston Scientific for providing these very topical, interesting, and motivational presentations. They also provided more in-depth seminars to the rest of the students and faculty during their visits.

As Chair of the ABET Committee for the Department, he is pleased to report that ABET has added the BSEE to the current BSECE accreditation. The BSECE and BSEE program accreditation extends through to Fall 2016. All of the SCSE engineering programs will undergo a new accreditation review cycle with preparation of the self-studies and data collection starting in Fall 2014. The ABET accreditation process is an outcomes-based assessment process that has participant from our constituents that include alumni, the External Advisory Board, students, faculty, and the public and private sector employers of our graduates.

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The numbers of engineering students taking the Fundamentals of Engineering Examination has increased over the last few years. He assisted the UMD Continuing Education in the design and implementation of an examination preparation course. There have been an increasing number of EE examinees. He has been the Chief Proctor for the UMD site through the last paper offerings on 13 April 2013 In addition to a training WEBINAR, he participated as a member of the NCEES Standards Committee for electrical engineering , at the national level, for the new computerized offering that started Spring 2014. Students and practicing professionals are now required to sign up at a local Pearson-Vue test site for the computer-based examination.

UPDATE FROM PROF. CHRIS CARROLL



Christopher Carroll assisted with offering four week-long summer camps at UMD during July and August, 2014. These camps exposed middle school students to Electrical Engineering topics in one pair of camps, and topics from Civil, Electrical, Industrial, and Mechanical Engineering in the other pair of camps. All together, almost 70 middle school students participated in the camps.

In October, Dr. Carroll presented a paper at the ASEE regional conference in Iowa City. That paper reported experience gained in offering EE 2325, Microprocessor Systems, using a new processor, the ATmega32 microcontroller. The switch to this device was made in response to student interest in that processor due to its use in the popular Arduino microcomputer systems that have been embedded by students in senior projects and elsewhere. Now in its third semester of use in EE 2325, the ATmega32 is becoming a solid vehicle with which students learn to program in assembly language.

UPDATE FROM INSTRUCTOR TOM FERGUSON



Mr. Tom Ferguson is happy to report the department was granted a 5-year experimental radio license by the Federal Communications Commission (FCC) for lab experiments in the 460 MHz UHF band. The license with other interfering systems. allows limited use of transmitters for evaluating electric field strength values around various antennas. He is also involved in a major MNDRIVE project with his co-investigators NRRI researchers Donald Fosnacht and Brian Brashaw, UMD's Randall Hicks of Biology, and James Skurla of Human Resources and Equal Opportunity, as well as Michael Sadowsky of the Biotechnology Institute, John Lamb of Soil, Water and Climate and Paige Novak of Civil Engineering from the University's Twin Cities campus. The Natural Resources Research Institute at the University of Minnesota Duluth received $500,000 from the University of Minnesota's MNDrive Transdisciplinary Research Program to implement "Smart Bioremediation Technology" to reduce sulfate concentrations in northeastern Minnesota watersheds. Pilot scale designs of the technology have already shown significant reductions of sulfate from legacy iron ore mine pit lake waters. The MNDrive funds will expand the initial pilot study to measure efficacy, determine scale-up potential and study complex interactions

UPDATE FROM PROF. IMRAN HAYEE



Dr. Imran Hayee and his graduate students are working on the three following projects. "Delivering In-Vehicle Messages in Temporary Work Zones" is funded by the US Department of Transportation. The "DSRC Based Warning System for Workers Safety" is funded by the Minnesota Department of Transportation. "Acquisition of real-time relative vehicle trajectories to facilitate freeway merging using DSRC based V2V communication" is funded by the US Department of Transportation and Roadway Safety Institute of the University of Minnesota and the "Development of Hybrid DSRC-PCMS Work Zone Information System Using DSRC Based V2V Communication" is funded by the Center of Transportation Studies.

UPDATE FROM INSTRUCTOR SCOTT NORR



Mr. Scott Norr has been busy developing the course content to teach EE 5351 – Robotics and EE 5522 – Power Electronics. In addition, he has taken on the role of advisor for the Battle-Bots Club. In his spare time, Scott has been tinkering with the idea of Self-Tuning Passive Filters for Electric Power Distribution Systems.

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UNDERGRADUATE NEWS



Peter Noll, Zack Graves and Brent DeVries: "SMART BOW-SIGHT" – a laser range finder and accelerometer equipped bow-sight that automatically selects a fiber optic pin based on distance to target and orientation of bow.



Yaro Bagriy, Matt Engel, Dan Benard and Ben Strobel: "Helios" – A 3D printed orb that contains a Spark Core development board capable of authenticating to the internet over wi-fi. A custom android app allows Helios to sniff the notifications stream on your smartphone and react to the information in a user definable manner.



Jared Hansen, Jack Link, Aaron Schiller and Rob Toland: "A Bluetooth Enabled Lamp to Combat Seasonal Affective Disorder" – Using a Bluetooth enabled Arduino, the lamp communicates with a custom android app on the users cellphone to work as an alarm clock, slowly increasing its light level over the course of an hour to simulate sunrise. The light spectrum emphasizes blue hues that are beneficial for SAD.



Ben Niemann, Austen Bryan and Nate Anthony with their traffic counter.

2014 Engineering Scholarship Awardees



Top Row: **Jerald Thomas (Duluth Engineers Club Scholarship), Nicholas Robillard (Roy Labounty Scholarship) Jordan Gaytan (Minnesota Power Foundation Scholarship), Bergur Gudbergsson (Electrical and Computer Engineering Alumni Scholarship)** Bottom Row: **Vashti Hanline (Mary Ann and Jerry Ostroski Engineering Scholarship), Vinson Gee (Robert J. Marchetti Engineering Scholarship), Victoria Bourget (Thor A. Gustafson Scholarship), Kelli Fuchs (Erin Swieringa Memorial Scholarship), Garett Hendriksen (Electrical and Computer Engineering Alumni Scholarship), Austen Bryan (Schott Foundation Scholarship),** Not Pictured: **Kelsey Miller (Thor A. Gustafson Scholarship), and Joshua Macvey (Cliffs Natural Resources Scholarship) Thank you to all our sponsors, and congratulations scholarship recipients!**

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GRADUATES

Spring 2014

B.S.E.C.E.

Daniel Bernard	Aaron Buehler
Eric Canniff	Blake Carlson
Sean Davey	Steven Donoso
Matthew Engel	Aaron Frahm
Matthew Koloski	Timothy Kosanke
Brian LaPine	Joshua MacDonald
Alexander Pahl	Rick Sandeen
Matthew Stoddard	Benjamen Strobel
Jason Vanderlinde	

B.S.E.E.

Jared Hansen	Cody Johnson
John Link	Zachary Mjones
Devon Nelson	Benjamin Niemann
Tyler Roschen	Aaron Schiller
Rob Toland	Zachary Whitney

M.S.E.C.E.

Rini Shrestha	Xiaohu Qian

Expected Fall 2014

B.S.E.C.E.

Vinson Gee	Michael Grew
Siu Yuen	

B.S.E.E.

Yaroslaw Bagriy	Austen Bryan
Therence Chi	Michael Grew
Marcus Hale	Jake Jacobson
Colin Lesnar	Cody Nascene
Joel Peterson	Mark Rice
Jacob Walker	Logan Walsh

M.S.E.C.E.

Sai Divya Anne	Sayali Kulkarni
Maria Minhas	Sanjana Venus

Battlebots

Battlebots club is a great opportunity for both beginners and enthusiasts alike to design and build a robot for combat based competition. They are currently in the process of designing and modifying two separate 15lb robots for this season. The club website at Bulldogbots.com details their current progress and latest developments, as well as other information about previous bots and projects. They are always looking for donations and sponsorship opportunities, if you're interested in helping the club out, please contact them.



IEEE Student Branch

IEEE UMD Student Chapter continues to grow as we encourage students become involved with the IEEE Arrowhead Section as well as the Electrical Engineering department at UMD. During the 2014 Spring semester, we had a small fundraiser where students and faculty could purchase grey Electrical Engineering jackets. We also continue to hold picnics every semester and plan to have at least one tour in the Duluth area this year.

First Robotics

Dr. Stan Burns is a member of the State of Minnesota FIRST Robotics Planning Committee. UMD will host the regional kickoff event for the FIRST Robotics competition on 3 January 2015. Over 20 schools are expected to participate. The Lake Superior Regional will be held February 26-28 at the DECC with up 120 schools participating. March 2014, we had close to 120 schools participate, which makes the local tourism folks very happy. The DECC is now at capacity for this event which is one of the largest in the country.

GRADUATE STUDENT WORK

During the year of 2014, we have seven new graduate students joining the MSEE program. Zhiyuan Peng, Nazanin A.Banaeiyan, Syed Salik Hafeez, Ibrahim Baz Khallouf, Yuhang Sun, MD Islam Swapan and Attiq UZ Zaman. Welcome all of you!



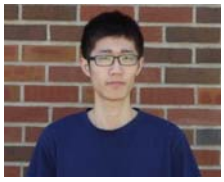


Mr. Nawjif Hasan joined our graduate program in Spring 2013. His research work is on the regulation of voltage–source provider circuit for artificial skin pressure sensor array. This research project is co-advised by Dr. Debao

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Zhou (MIE department) and Dr. Jing Bai. Prior to his study at UMD, Nawjif received his B.Sc Degree from the American International University in Bangladesh.

Mr. Bo Wang joined our graduate program in Spring 2013. He works with Dr. Jing Bai for his research topic on the stability analysis of pulse evolution in ring-cavity quantum cascade lasers under group-velocity dispersion. Prior to his study at UMD, Bo received his Bachelor's Degree from the University of Science and Technology of China (USTC).



Mr. Yuhang Sun joined our graduate program in Fall 2014. His research topic is on the design and fabrication of artificial skin pressure sensor array. This research project is co-advised by Dr. Debao Zhou (MIE department) and Dr. Jing Bai. Prior to his study at UMD, Yuhang received his Bachelor's Degree from the University of Science and Technology Beijing, China.



Mr. MD Shaiful Islam Swapan joined our graduate program in Fall 2014. He works with Dr. Jing Bai for his research topic on the reshaping of quantum-cascade laser pulses under self-phase modulation and group-velocity dispersion. Prior to his study at UMD, Mr. Swapan received his Bachelor's degree from the Chittagong university of Engineering and Technology, Bangladesh.



Viet Nguyen will be defending his work, "Development of DSRC based Vehicle to Vehicle (V2V) Communication Traffic Information System using multiple ad-hoc hosts for frequent acquisition and dissemination of traffic parameters" in Spring 2015.

FACULTY PRESENTATIONS AND PAPERS

J. Bai and D. Zhou, "Effect of group-velocity dispersion on the stability of quantum-cascade lasers," *Journal of Nanophotonics*, vol. 7, no. 1, 073079, October 2013.

Debao Zhou, Haopeng Wang, Jing Bai and Jianguo Cao, "Effects of oxygen plasma treatment and E-beam evaporation on AgNWs/PDMS based stretchable electrode", *Smart Materials and Structures*, vol. 23, no. 10, 104001, October 2014.

U. Ibrahim, M.I. Hayee, and Eil Kwon; "DSRC Based Hybrid Work Zone Information System with Portable Changeable Message Signs", *Transportation Research Record, Journal of Transportation Research Board*, No. 2380, pages 29-35, 2013.

Hai Dinh*, H. Tang, E. Kwon, "A Simple Method for Camera Calibration for Roundabout Traffic Scenes using a Single Circle", *IET Intelligent Transport Systems*, Vol. 8, No. 3, pp. 175-182, May 2014**.**

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ALUMNI NEWS

We want YOU! We would like to know and share what our alumni have been up to since graduation! Please send us an email or give us a call, we can even include a picture!

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!!!!NEW NEWS!!!

Please note this is the LAST paper form of the newsletter unless you request it! Please look for the latest updates in our new and improved webpage starting in December or January!

http://www.d.umn.edu/ee/

If you would like to make a donation to support the efforts of the EE Department and/or for scholarships, you may send your contributions to:

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