



Newsletter – October 2010

Electrical and Computer Engineering Welcomes Class of 2014

This year there are 60 students entering the Electrical and Computer Engineering program, a significant increase from last year. Of these 35 are majoring in Electrical Engineering and 25 are majoring in Computer Engineering.



CANEUS Fly-By-Wireless Conference

The CANEUS Fly-By-Wireless conference held on August 27th of this year brought together a group of over 60 people from 9 different countries to the University of Maine. The CANEUS conference, which was chaired by Dr. Ali Abedi, is a conglomeration of government, business, and scientists that focus on the advancement of wireless communications with a focus on aerospace applications.

At the August 27th conference, UMaine hosted representatives from companies like Bombardier and Boeing, several universities to include McGill University, MIT, the University of Tokyo and government agencies such as NASA. During the conference objectives that were outlined during the CANEUS conference held in Montreal in 2009 were discussed to measure their progress and eight new projects

to be implemented in the next two years were outlined. Included in the new set of objectives is a business case-study that will entail using defined metrics to ascertain the cost benefit of using wireless technology, and the second was developing a small scale demonstration of application in an aircraft. There will be mid-year reviews of these projects at the conference that is schedule in the January-February time frame in Europe but real success and results will be seen at the next Fly-By-Wireless scheduled for May 17-20 in Montreal.



Presentation at the CANEUS Fly-By-Wireless Conference

Maine Technology Learning Initiative raises food for U.N.

On May 27th of this year more than 1,000 participants, mostly students, fought hunger by answering vocabulary and math questions on their state-issued laptops. By the end of the day the group was able to raise more than 2.3 million grains of rice to be distributed around the world. The efforts were part of this year's Maine Learning Technology Initiative held annually at the University of Maine, organized by the Maine Department of Education. ECE faculty Bruce Segee, Yifeng Zhu, and Mohamad Musavi contributed significantly to the success of this conference.

The conference partnered with the United Nations World Food Programme (WFP) to host students and teachers on a specially-developed version of FreeRice.com. FreeRice.com is a website where rice is donated to the WFP for every correct answer to questions centered around vocabulary, mathematics, geography, science and more.

“This is a clear demonstration of what we have said since the inception of the laptop initiative – it’s not about machines or software, it’s about using technology to make learning personal and relevant to students,” said Angela Faherty, Acting Commissioner of the Maine Department of Education. “In the process, they can literally change their own worlds and the larger world. It’s a beautiful thing to watch unfold before your eyes.”



Students use their state issued laptops to raise food on FreeRice.com

Maine's laptop program is the first to work with FreeRice.com to create a localized effort to raise food for the hungry. A customized version of the site will be available for Maine students to continue their efforts, as well as guests from around the world. In addition to raising rice for the WFP, students also made a contribution to fight local hunger by bringing non-perishables to be donated to the Good Shepherd Food Bank.

In addition to their work with the World Food Programme, students and teachers attended workshops with the goal of providing new ideas to teach technology in their own schools. Finally ten lucky students left with some very valuable door prizes. The University of Maine Department of Electrical and Computer Engineering donated ten \$1,000 scholarships to students who enter the department’s program.

ECE Alumni Weekend



Alumni visited with Dr. Mohamad Musavi, Chair of ECE at the College of Engineering Reception in June during Reunion weekend. From L to R: Earl Dawley '50, Gerald M. Palmer '61, Dr. Mohamad Musavi, Jeffrey A. Jones '75 and Mohamad Makhoulf '75.

IEEE Region 1 Northeast Industry Day

The 2010 Northeast Industry Day was held in Portsmouth, New Hampshire on September 24 and was sponsored by the IEEE Boston, Maine and New Hampshire Sections and facilitated by IEEE Region 1. IEEE Industry Day provides a forum for industry and academic leaders along with technology providers to openly discuss relevant issues and potential solutions using emerging technologies. The conference provided unique opportunities to develop partnerships to connect solution providers with end-users and funding agencies. ECE faculty member, Dr. Ali Abedi chaired the conference which was attended by over 130 attendees.



l-r: Mohamad Musavi, Chair ECE Dept., Dana Humphrey, Dean of Engineering, and Dr. Ali Abedi

2010 Summer Research Experiences

The Summer of 2010 offered two NSF-REU research experiences for undergraduate programs and one NASA research program.

Supercomputing Undergraduate Program (Super ME)

In the third of a three-year project sponsored by the Undergraduate Research Experiences (REU) of the National Science Foundation (NSF) in collaboration with the Department of Defense, ten undergraduates from six different universities participated in scientific exploration ranging from engineering sciences with a focus on scientific computing and visualization. The program was led by ECE faculty Dr. Yifeng Zhu and Dr. Bruce Segee. The projects involved eight faculty from seven departments. Students worked closely with their faculty advisors, post-doctorates

and graduate students on the various projects such as exploiting multiple GPUs to accelerate scientific computation, evaluation parallel I/O performance in cloud computing, and building friendly human-machine interfaces for large-scale high resolution display walls. The motive of this three-year project was to stimulate the interest of undergraduates to pursue graduate degrees.



Upper from L-R: Matthew Edwards (University of Maine), Craig Verrill (University of Maine), Zachary Smith (Rensselaer Polytechnic Institute), Matthew Dunn (University of Maine), Timothy McGrath (University of Maine), Catherine Sullivan (Rochester Institute of Technology) Lower from L-R: Brandon Abbott (University of Denver), Gerry Shannon (University of Southern Maine), Breana Coyle (Saint Anselm College), Kevin Dembers (University of Maine)

NSF Research Experience for Undergraduates in Sensors

Summer 2010 saw another successful research experience for undergraduates program in the area of sensor science and engineering in the Electrical and Computer Engineering Department and the Laboratory for Surface Science and Technology (LASST). Twelve students, five of them from outside of UMaine participated in a wide range of research projects ranging from various acoustic wave sensors to nanoparticles for sensing to implantable biosensors. The program led by Dr. John Vetelino and Dr. Nuri Emanetoglu was the second of a three-year project sponsored by the National Science Foundation. Four students received awards for their work at the REU 2010 Sensors conference held at the end of the program.



L-R front row: Jamie Reinhold (University of Maine), Bryn Nugent (University of Maine), Amit Patel (New Jersey Inst. of Technology), Kevin Huang (Trinity College), back row: Mason Carney (University of Maine), Gabrielle Grandchamp (Brown University), Eben Estell (University of Maine), Paul Wilson (University of Maine), Rahim Stennett (New Jersey Inst. of Technology), Michael Fitzgerald (University of Maine), Joseph Grace (University of Maine), Soukaina Dahan-Stitt (Embry-Riddle Aeronautical Univ)

NASA Summer Program

Since its inception in 1992, Maine Research Internships for Teachers and Students (MERITS) has provided summer and school year opportunities to hundreds of teachers and students at more than 70 businesses and non-profit laboratories across Maine.

During summer 2010, three high school students participated in NASA funded research at the Wireless Sensor Networks Lab (WiSe-Net) in the Electrical and Computer Engineering Department. Projects ranged from Game Theory in the Computer Engineering area to Wireless Shape Monitoring in the Electrical Engineering area. Graduate and undergraduate students involved in the NASA project helped in mentoring MERITS students under the supervision of Dr. Ali Abedi, Assistant Professor of ECE and Director of WiSe-Net lab.



L-R standing: Adam Marsano, Anin Maskay, John Tkach, Kale Schrade, Dr. Ali Abedi, Alex Servadio, Fred Schwaner, L-R seated: Abolfazl Razi, Ratemeh Afghah, Joel Castro, Molly White, Zach Marvin, Codv St. Louis.

MERITS is a program that strengthens research opportunities for Maine's teachers and students interested in science and technology by placing them in laboratory or field settings. Designed around the premise that research is among the best teaching tools, MERITS includes programs for K-12 teachers and preserves teachers, high school students, and college students. The MERITS Program not only forges new collaborations among industry, research, and education in the state, but also serves to strengthen an educational foundation that helps to produce a highly-skilled workforce to meet the needs of Maine businesses and research communities.

Publications

Peer Reviewed Publications

N. Hariri, **A. Abedi**, "RSMG: Coding-aware Routing Based on Stable Matching Game", International Conference on Wireless Networks, July 2010, Las Vegas, NV, 5 pgs. published on CD.

A. Razi, **A. Abedi**, "Distributed Coding of Sources with Unknown Correlation Parameter", International Conference on Wireless Networks, July 2010, Las Vegas, NV, 5 pgs. published on CD.

K. Yasami, **A. Abedi**, "A Cross Layer Design for Energy Aware Target Tracking in Wireless Sensor Networks", International Conference on Wireless Networks, July 2010, Las Vegas, NV, pp 460-465.

F. Afghah, **A. Abedi**, "Stochastic Game Theoretical Model for Packet Forwarding in Reliable Relay Networks", International Conference on Wireless Networks, July 2010, Las Vegas, NV, pp. 227-233.

J. Chen, **A. Abedi**, "High-Resolution Hybrid Localization In Passive Wireless Sensor Nets", 25th Biennial Symposium on Communications, May 2010, Kingston, Canada, pp. 126-129.

T. Falkner, **A. Abedi**, J. Paul, M. Hayes, "Improving The Signal To Noise Ratio Of Event Related Eeg Signals In High Risk Newborns", 25th Biennial Symposium on Communications, May 2010, Kingston, Canada, pp. 28-31.

F. Afghah, **A. Abedi**, "Wireless Cooperative Relaying Using Game Theory," in Proceedings of 3rd IEEE International Fly-By-Wireless Workshop, August, 2010, Orono, ME, published on CD.

K. Schrader, **A. Abedi**, "Impact Localization and Scaling for SHM of Inflatable Habitats," in Proceedings of 3rd IEEE International Fly-By-Wireless Workshop, August 2010, Orono, ME, published on CD.

A. Razi, **A. Abedi**, "Hierarchical Network Development of Wireless Passive Sensors," in Proceedings of 3rd IEEE International Fly-By-Wireless Workshop, August 2010, Orono, ME, published on CD.

W.D. Duy, B. Hackett, T. Mlsna and D.J. Neivandt, **J. F. Vetelino**, "Detection of Peroxide Based Explosives Utilizing a Lateral Field Excited Acoustic Wave Sensor," The 13th Int'l Mtg. on Chemical Sensors, Perth, Australia, July 11-14, 2010, p. 274.

A. Shareef, and **Y. Zhu**, "Energy Modeling of Wireless Sensor Nodes Based on Petri Nets", in the Proceedings of the 39th International Conference on Parallel Processing (ICPP'10), San Diego, CA, September 2010, Pages 1-10. (Acceptance rate: $33/133 = 24\%$).

J. Yue, **Y. Zhu**, Z. Cai, L. Lin, "Energy and Thermal Aware Buffer Cache Replacement Algorithm", in Proceedings of the 26th IEEE Symposium on Massive Storage Systems and Technologies (MSST'10), Incline Village, NV, May 2010, Pages 1-10, ISBN: 978-1-4244-7152-2 (Acceptance rate: $18/53 = 34\%$).

Q. Zou, **Y. Zhu** and D. Feng, "A study of Self-similarity in Parallel I/O Workloads", in Proceedings of the 26th IEEE Symposium on Massive Storage Systems and Technologies (MSST'10), Incline Village, NV, May 2010, ISBN: 978-1-4244-7152-2.

Gifts/Donations

FLIR Systems, Inc., Donation to the Allison I. Whitney '62 Fund \$1,000 - May
Kepware Technologies, \$5,500 - August
Dwight M. Lanpher, \$50.00 - August
Raymond & Hannah Whitney to the Allison I. Whitney '62 Fund, \$11,000 - August
Raymond H. Spooner to the Allison I. Whitney '62 Fund, \$500.00 - August
Ralph & Elizabeth Applegate, \$250.00, September
Miroslav Juric, \$50.00 - September
Timothy R. Osborne, \$250.00 - September
Fannie Mae Foundation matching gift, \$400.00 - September
Microsoft Giving Campaign matching gift, \$300.00 - September

Grants Received

Y. Zhu (PI, 34%), B. Segee (co-PI, 33%), P. Koons (co-PI, 33%), “CDI-Type I: GPU-Accelerated Interactive Supercomputing for Climate Studies in the Northern Environment”, NSF, \$454,580, 9/24/10-2/4/11.

Other

Since June the faculty have submitted proposals for a total of about \$4,600,000.

We are pleased to inform you that during the 2010 academic year the Electrical and Computer Engineering Department received more than five million dollars in sponsored awards, which is the third highest among all UMaine departments and schools.