



Engineering Newsletter

Fall 2007

Welcome Back from Dean Traver

Welcome back to your home away from home! I hope everyone is looking forward to a great year. There are so many exciting things happening in Engineering at Union that it seemed like a good time to initiate a newsletter to keep everyone informed. I will look forward to discussions about these activities and developments or whatever else is on your mind. Please stop by my office anytime.

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Summer Research

Many engineering labs were busy this summer as the following students worked on research projects with faculty.

Jaromir Horejsi
Shi Guang Huang
Long Nguyen
Susan Beckhardt
Andrew Heiser
Matthew Adams
Wendy Beatty
Michael Bono
Emily Green
Joseph Martel
XiaoLe Xie

James Doane
John Dunham
Craig Ferguson
Guo Hong Ho
Ondrej Nikel
Dean Pasquerella
Michael Topka
Caleb Wattley
Charles Wood
Isaac Rogers

You can start planning a summer research project in the winter term by discussing available opportunities with faculty.

Strategic Plan Update

As you probably know, engineering is featured very prominently in Union's new Strategic Plan. (www.union.edu/strategic) New initiatives in bioengineering, environmental engineering, and engineering/liberal arts integration are being developed as part of this plan. The work plans for these initiatives will be available soon on the strategic planning Blackboard site "Strategic Plan Implementation" that you are all enrolled in.

Over the summer administrators, faculty, staff, and students participated in discussions about other components of the strategic plan as we move toward the implementation phase of the plan. The topics this summer were: Academic challenge, Diversity, Global Education, and Innovation. There are more scheduled for this fall and you are encouraged to attend:

September 12: Greek Life at Union

September 19: Minerva Programs

September 26: Student Development and Leadership opportunities (including programming and housing options)



Sponsored by ASME, IEEE, NSBE, SHPE, & SWE
Engineering Challenge BBQ



Many enjoyed the food, games, and fellowship provided at the spring engineering barbeque in June. Each of the engineering societies sponsored a game, and teams of faculty, staff, and students participated in the challenges. Thanks much to the planning committee, especially Bridget!

Brian Feldman
Christopher Vargas
Jessica Sosa
Alfredo Guevara
Bridget Austin
Tehtena Tenaw
Selin Whitham
Brendon Keinath
Andrew Lockwood
Craig Ferguson

The 2006 challenge winners were: Malysa Cheng, Michelle Rogers, and John Boyle. Congratulations!

New Engineering & Computer Science Faculty

We are very fortunate this year to welcome four new engineering and one new computer science faculty members to Union. Below are descriptions of their research interests and a preview of their teaching schedule for this year. Please welcome them!



Rebecca Cortez

Ph.D. in Materials Science and Engineering, Northwestern University
B.S. in Mechanical Engineering, Washington University

Recently, I had the opportunity to conduct research in the areas of microelectromechanical systems (MEMS) technology and micro- and

nano-scale materials characterization. MEMS technology involves the integration of miniature mechanical structures, sensors, and electronics on a common substrate. The miniaturization of electronic and mechanical structures and devices is dependent on a fundamental understanding of the materials which comprise them. Therefore, basic research of the morphology (surface appearance) and performance characterization of these materials is paramount to their insertion in future applications. My teaching and research interests lie in materials science and engineering principles, the relevance of materials in design applications, the role of materials in microelectronic devices, materials characterization, and the general areas of fatigue and failure. I hope to share these interests through collaborative projects with Union students and other researchers.

Ashok Ramasubramanian

Ph.D. in Mechanical Engineering, Dartmouth College
M.S. in Electrical Engineering, University of Massachusetts
B.E. in Electronics and Communication Engineering, Anna University, Chennai, India

My primary area of research in Biomechanics - the study of mechanics and material properties of biological tissues. I am particularly interested in the biomechanics of heart development in embryos. Control theory is another area in which I have substantial interest and my work often involves feedback control in a biomechanical context.

I am setting up my lab to work with chick embryos and I hope to work with undergraduate students in a project studying the biomechanics of blood vessel development.

I will be teaching Dynamic Systems (MER 322) in the Fall term. I will be teaching some mechanics classes in future terms.



Jennifer A. Currey

Ph.D. Biomedical Engineering, Rensselaer Polytechnic Institute
MS Mechanical Engineering, Rensselaer Polytechnic Institute
B.S. Biomedical Engineering, Rensselaer Polytechnic Institute



My research is in the area of bone healing. My primary focus is on healing around implants subjected to micromotion. The project that I am currently involved in is looking at healing around implants subjected to 150 um of axial motion. The implants are being studied in a mouse model. My particular interests in this project are the strain levels in the tissue as a result of the implant motion. This strain is believed to affect the type of tissue that is present around the implant, i.e. high strain inhibits bone formation. The strains are evaluated using finite element models that model the various implant designs and anatomical constraints (the size of the hole the implant is placed in and the distance between cortices of the bone) and material properties of the healing tissue. I am hoping to develop new models that will look at various implant surfaces and loading conditions. I am also interested in developing an iterative model where the finite element model will be adjusted based on the healing that is occurring at various time points in the study. I will be teaching Strength of Materials and Advance Strength of Materials.

Helen Hanson

Ph.D. Engineering Science, Harvard University
S. M. Engineering Science, Harvard University
MS Library and Information Science, Simmons College
B.S. Computer Science/Modern Languages, Union College



My research is focused on acoustic models of speech production, and how acoustic data can be linked to higher-level representations of speech utterances. There are a few areas that would be great for student involvement: work-in-progress on speech respiration and prosody, plus upcoming projects on developmental issues (i.e. children's speech) and cross-language or second-language phenomena. This year I'll be teaching Circuit Theory, Circuits and Systems, Communications Systems, and an upper-level elective related to speech.

David Hodgson

Ph.D. Mechanical Engineering, Colorado State University
B.S. Mechanical Engineering, RPI
Many of you know Professor Hodgson already, but he has been promoted from a visitor to a more permanent position.

Kristina Striegnitz

Ph.D., jointly awarded by the Saarland University (Faculty of Humanities) and the University Henri Poincaré Nancy 1 (Faculty of Science and Technology) "Diplom" (Masters) in computational linguistics, Saarland University



My research is in natural language processing, that is, I am trying to build computer programs which can interpret input and produce output in a natural language, such as English, German etc. In particular, I am interested in modeling dialog, including the non-verbal aspects that make human face-to-face communication work so well. So, I have worked on Embodied Conversational Agents, which are animated computer characters that serve as an interface to some computer program and that interact with the human user using natural language and gesture.

I am also involved in a new effort to set up a natural language generation challenge. The task of this challenge will be to build a computer system which produces natural language instructions to help a human user navigate in a 3D virtual environment. Researchers will be invited to submit systems which will then be evaluated and compared in a common 3D scenario. As a first step, there will be a competition of systems built by students in late 2008. I think it would be fun to participate in this competition with a group of students. So, if this sounds interesting to you, contact me! (I don't expect any prior knowledge of natural language processing.)

I will be teaching introductory computer science classes, courses on artificial intelligence and natural language processing, and courses on the theoretical foundations of computing. For example, this fall I am teaching "Theory of Computing" and in winter I am teaching "Can Computers think?", which is an introduction to computer science and programming that focuses on artificial intelligence.



The new Carl Zeiss EVO-50VPX Scanning Electron Microscope (SEM) located in Butterfield 205.

Grant News from 2006-2007

Several faculty were successful this last year in applying for grants and fellowships from the National Science Foundation and other government and private foundations to support research and curricular projects.

Institutional Grants:

The National Science Foundation grant entitled "Supporting Scholars in Science and Engineering" will support scholarships for 2 cohorts of 10 "CT Scholars" in science and engineering disciplines from the classes of 2011 and 2012. This group of students will be part of a pilot study to explore ways to foster interdisciplinary study within science and engineering. Professor Anderson will be directing this program for the first cohort.

Faculty Research Grants:

A grant for \$299K from the National Science Foundation, combined with a grant for \$100K from NYS has allowed the College to purchase a new Scanning Electron Microscope that will benefit several departments. The SEM is installed in BU 205 and faculty and students have been trained in its use.

Professor Wilk has been awarded a \$39,922 grant from NYSERDA for development of a Solar Thermal Collector System for Powering a Trochoidal Gear Engine/Generator. This work will be in cooperation with a local company, Ener-g-rotors and includes funding for student participation in the research.

Professor Anderson and Professor Carroll received a Major Research Infrastructure grant of \$172,574 from NSF to expand the capacity and functionality of the aerogel lab.

The Jerome A. Schiff Charitable Trust \$30,000 Faculty Research Award was presented to **Professor Catravas** for her study on "Visualization of Information Content in Music Signals and Interdisciplinary Applications."

Faculty Fellowship:

Professor Ghaly received a Fulbright fellowship last year to spend a term in Alexandria, Egypt to work on a research project. While in Egypt, Professor Ghaly also developed a new mini-term, "Ancient & Modern Egypt," to be offered for the first time this winter.

Grants Received by Computer Science Faculty:

Professors Fernandes and Cass received an NSF grant for \$150,000 for their project on "Appreciating Technology and Understanding Science Through Usability Studies". This grant provides funds for new equipment for research and a new course to be offered this year on User Interfaces.

Professor Barr is involved in two new NSF curriculum grants. One grant for \$560K, joint with Lafayette College, will focus on a campus wide computation initiative built around a new computational science curriculum. The second grant, joint with SUNY Albany, RPI, SCCC, and the Schenectady Museum, has the goal of developing a social robotics curriculum that will draw students into CS as well as engage students from other disciplines with key CS and engineering concepts. This is a \$362K grant, of which Union will receive \$41K.

Fall Events at the Becker Career Center

The Becker Career Center will be welcoming a new Director this fall, and they have planned some events especially for engineering students. I urge you to take advantage of these opportunities. See the career center for more details.

U-Connect

Monday, October 1

3-6pm

College Park Hall

Many alumni will attend this event. It is a great networking opportunity and a chance to get a jump start on finding exciting jobs and internships.

Engineering Consortium Career Fair in NYC

Columbia University

Friday, October 26

Over 140 employees will be there!

FIE 2008 to be Hosted by Union



Frontiers in Education

Racing Toward Innovation in Engineering Education

The Saratoga Hotel and Conference Center
Saratoga Springs, New York
Wednesday-Saturday • October 22-25, 2008

The Frontiers of Education conference is a premier international conference that focuses on computer science and engineering education. In other words, it is where engineering and computer science faculty present papers and discuss teaching and student learning.

This conference will be held in Saratoga Springs on October 22-25, 2008 and Union College will be the academic host. We will be asking for student volunteers next fall to participate in the conference and help out with the logistics.

Dean Traver is the General Chair of the conference and Professor Anderson will be the Workshop Chair. The conference has been held in Milwaukee, San Diego, Indianapolis, Savannah, and Boulder over the last 5 years. Check it out at: <http://www.fie-conference.org/08/>

Student Groups

We have the following list of officers for our engineering professional societies and clubs. Please help us fill in the blanks.

IEEE	Advisor: Prof. Rudko
President	Greg Maier
Vice President	Dave Harwood
Treasurer	Joe Ciaburri

ASME	Advisor: Prof. Bruno
President	Melysa Cheng
Vice President	Tehtena Tenaw
Treasurer	Selin Whitham
Secretary	Diana Polli

SWE	Advisor: Dean Traver
President	Selin Whitham
Vice President	Christine Farrell
Treasurer	Caileigh Warren
Secretary	Malysa Cheng
Webmaster	Michelle Rogers

NSBE	Advisor: Prof. Hedrick
President	Tehtena Tenaw
Vice President	Claribel Azcona
Treasurer	Johnny Jean-Calixte
Secretary	Wei Jia Bao
Public Relations	Jessica Sosa

SHPE	Advisor: Prof. Almstead
President	Jessica Sosa
Vice President	Chris Vargas
Treasurer	Claribel Azcona
Secretary	Stephen Sanchez
Public Relations	Kamara Simpson
Webmaster	Jerome Howard

BAJA Club	Advisor: Prof. Bruno
President	Matt Beenan
Treasurer	John Perna

Tau Beta Pi	Advisor: Prof. Spinelli
President	Joseph Martel
Vice President	Dean Pasquerella
Treasurer	Xiao Xie
Secretary	Alexander Weintraub

Eta Kappa Nu	Advisor: Prof. Hassib
President	Greg Mahlum
Vice President	Ben Bayes
Treasurer	Daniel Harkenrider
Secretary	David Harwood
Secretary	Long Nguyen