News from the Department Head

Dear Alumni and Friends

Greetings from Duluth! We have a lot of exciting projects and changes in the MIE Department, many of which are described in this issue. We will have a grand reunion next year to celebrate 20 years of engineering at UMD.

Our BSME program has been accredited by ABET, Inc. The next general review for all the engineering and computer science programs will be in 2009. Working with our constituencies remains very important to us as we review our educational objectives and program outcomes and assess our performance.

We now have over 300 undergraduate students in MIE. We are changing our IE and ME programs to more effectively manage our resources and deliver the high-quality educational experience that most people expect. Many of our labs will be taught independently of courses in order to integrate material from different classes and eliminate duplication. This has worked well with our energy lab for the BSME program and has been suggested through our senior exit interviews. To help meet demand, we are offering several courses in the summer.

Study abroad is an integral part of our programs. Our strategic alliance with Luleå University of Technology continues to be the flagship model of exchange. Students also go to Australia, New Zealand, and Germany. We will begin offering 3-week faculty-led courses in the near future, which should appeal to more students.

Our grad programs continue to do well. The MSEM had a record number of graduates this past year, and the MEHS graduates swept the paper contest for the Semiconductor Environmental Safety and Health Association.

Many new replacement faculty have joined the MIE team.

Dr. Bob Feyen and Dr. Xun Yu are introduced in this edition. Other new instructors include Dave Keranen, Brett Ballance, Dr. Bachan Han, and Dr. Seraphin Abou. Hossain Khoroosi has moved to us from Chemical Engineering and continues to teach the engineering mechanics courses.

The University has launched a program for matching new endowed scholarships. Please see page 4 for details. This is a great opportunity for a group, say the Class of 19XY, to establish a scholarship in their name. What a great gift this would be!

We will have 20 years of graduates from all three engineering departments next year, so we are planning a special series of homecoming events. Please try to come to Duluth next year to see old friends, visit the department, and see what is new. Please let us know if you would like to help plan or make suggestions!

—Dave

MIE Student Club Update

Students attending UMD’s Mechanical and Industrial Engineering programs have many doors open to them for areas of competition and research, many through the MIE Club.

Currently, there are two groups consisting of about 6 people each that are working on ASME’s Student Design Competition for the ’06 – ’07 school year. Two years ago UMD took 2nd place in its region and this year hopes for 1st designing the Human-Powered Water Still.

Four MIE Club’s officers attended the Student Learning Seminar at the U of St. Thomas on October 13th – 14th, all which gained knowledge on leading and operating a student section. UMD also has a group of students that are working hard on the Formula SAE Car in hopes of entering it in the 2007 competition. The project is new to UMD and the students are learning not only about the car, but how to get a project of such capacity off the ground and running on a budget.

Undergraduate Research Opportunities (UROPS) were readily available to apply for at the beginning of the semester. Dr. William Pedersen took full advantage by brainstorming a few bright ideas for future design of Wind Turbines. If successful, one project will be to install a Wind Turbine at UMD to supply power, as well as teaching of research. Dr. Dan Pope also is working on receiving grants and is looking for students to apply for UROPS researching the use and feasibility of Bio-Diesel for marine use.
Congratulations to the Recent Undergraduate Program Graduates

Fall 2005
BSIE—Automated Systems
Lindsay Feldt
Jesse Johnson
Adam Marksteiner
Jacob Mason
Eric Petersen
Ryan Schafer
Jake Stoppelman
Sarah Trainer*

Adam Marksteiner
Eric Petersen
Ryan Schafer
Luke Schwartz
Jake Stoppelman
Sarah Trainer*

BSME
Daniel Abuan
James Boiley
Ryan Carlson
Peter Clark
Brian English*
Jana Galewski*
Justin Gregerson
Branden Hakala
Eric Klopp*
Justin Kolz
Michael Kostecka
Nathan Machacek
Mark McGuire
Michael Michlitsch
Trent Nelson
Halden Peterson
Nicholas Peterson

Spring 2006
BSIE—Automated Systems
Timothy Baczkiewicz
Brian English*
Rory Johnson
Tyler Kaszubski
Justin Kolz
Mark McGuire
Adam Stein*
Adam Zechmann

BSME
Christopher Berg
Aaron Daigle
Kevin (Tony) Ellis*
Jesse Johnson
Joshua Line

Senior Design Projects for Fall 2006

Sure-Fab LLC, in cooperation with a project team composed of members Craig Bourassa, Ashwin Limaye, and Keegan Vass from the University of Minnesota, Duluth senior design class are working on increasing production from 12 booms per week to 18. Being made completely of steel, there are many constraints based on the scale of their size and weight alone. The pieces manufactured at Sure-Fab LLC in Two Harbors, weigh 1780 lbs, and are the first 16 foot section of the 3 section 60 foot completed boom. The process consists of tacking, welding, inspection, and finally machining of the booms. The booms are painted and assembled at a different company. In order to accomplish the task of increasing production, several steps have begun, starting with standardizing work procedures, evaluating the process flow, and process time records.

Working for Minnesota Twist Drill, a drill bit manufacturer based out of Chisholm, Minnesota, has led to a very interesting project. The project stemmed from a problem of manual labor being used when it seemed not only unnecessary but ergonomically incorrect. There is no orientation to the blanks that come off the cutoff machine and thus they need to be sorted manually. The objective is to produce a detailed CAD design and bill of materials of a method to orient drill bit blanks (1/4” to 1/2” diameter) from a Lewis cutoff machine and directly feed them into a coning machine. This improvement shall increase throughput of the machine while simultaneously reducing work in progress. The progress to date in this project has been substantial. Several options include vibratory feeders, vibratory tables, conveyors, and vibratory hoppers. Currently we are looking into using some sort of hopper or hopper system with a vibratory motor attached to orient the blanks. Then we would feed these blanks onto a conveyor system that would take them directly to the coning machine. This system would also need to have some programmable logic to control the machines based on certain events. This system would eliminate all manual labor and would significantly improve throughput of this area of production.

MIE Student Competition FAA Project
The United States National Airspace System has more than 176,000 aircraft operations, take off and landings each day. A runway incursion is any occurrence in the airport runway that involves an aircraft, vehicle, person, or object that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing or intending to land. Currently there are about 5.4 runway incursions for every one million operations.

One of the FAA’s top priorities is to reduce the frequency of these incursions and the risk of runway collisions. The team will develop a design that enhances tower control of the traffic on the runway in order to maximize runway safety. More specifically, the design will entail putting in sensors and color coded in-pavement lighting along the “hold short” lines that interface with the control tower throughout the airport. By doing this the tower’s controller will be able to have more redundancy in communication when the weather is bad and in low visibility conditions such as heavy snow and fog.

Curtis Oil Michael Seide, Laurie Benson, Nathan Vetsch and Patrick Letourneau have been assigned to predict the impact of the proposed Cirrus Drive and traffic signal project on the neighboring Curtis Oil businesses. The Cirrus Drive project will result in changes to the access onto the Curtis properties. This raises concerns about loss of business as well impacts on future business opportunities. The team will create a traffic flow optimization for the Curtis Oil Facilities (cont. pg 3)
Alumni Updates

Nathan Beckrich (BSIE 03) works in industrial automation at The Brass Company.

Cullen Boyd (BSIE 03) is a Sales Engineer at Brookdale Plastics, Inc.

Michelle Carl (BIE 96) has worked at Aarrowcast since 1997, started as an IE, then became IE Manager in 2002. She took on Quality System Coordination in 2004 and became an ASQ Certified Quality Engineer in December 2005. Currently wearing “many hats” as I’m sure many of my classmates are! She is married to Rick and has 2 boys: Eric, 7-years-old and William, 3 years-old.

Carol (Hogan) Crumb (BIE 99) and her husband Jeremy welcomed their second child in March ’06. Curtiss Alexander joins his older sister, Alexa. The family makes their home in Cottage Grove, MN. Carol is the Business Process Manager for Andersen Corporation in Bayport, MN.

Joel Gluntz (BIE 92) is a Quality Assurance Manager at Belden, Americas Division in Monticello, KY. He received a MSE, Purdue University 2004. He has Six Sigma Green Belt Certification and is an ASQ Certified Quality Engineer. He and his wife, Diane, have 2 children, Paul (6) and Delana (10 months).

Jon Carlo Gulbranson (BIE 00) recently graduated from Columbia Business School in New York with an MBA. He is a Senior Analyst for Crew Systems at Northwest Airlines in Minneapolis MN.

Trent Hard (BIE 95) is married to Sheri and they have a 2 1/2 year-old son, Matthew. They reside in Horace, ND. Trent is the Plant Manager of Infinity Windows: division of Marvin Windows.

John Kapla (BSIE/BSME 04) is working for Daimler-Chrysler in a management training program, CIE - Chrysler Institute of Engineering, finishing this Dec. I am also graduating with my Masters in Mechanical Engineering from the University of Michigan this Dec.

David Kuhn (BIE 95) and his wife, Yetta, welcomed their third son, Dillon Smith, on June 25, 2006. Dillon joins his older brothers Phillip (6) and Mitchell (2.5), and the rest of the family in Eden Prairie. David continues to be employed as an Engineering Manager by SeaGate Technology in Bloomington, MN.

Wesley Omer (BSIE 02) is a MFG Engineer, AGA Medical, Plymouth MN. Wes expects his MBA from the U of St. Thomas 2008.

David Pelletier (BIE 94) is a Sr Process engineer with Hutchinson Technology. He received a Masters of Manufacturing Systems Engineering from U of St Thomas in 2005.

Aaron Pitzenberger (BSIE 96) received a MBA from Iowa State University. He is Plant Manager of Cummins Filtration (formerly Fleetguard, Inc.) in Lake Mills, IA - a division of Cummins, Inc. www.cumminsfiltration.com

Jennifer Sasse (formerly Lee) (BIE 97) works as a Project Management Consultant with Hollstadt & Associates. She has a 2 year-old daughter, Madelyn.

Brandon J. Storhaug (BSIE 01, MSEM 03) is an Outsource Mfg. Engineer at 3M Medical Division in St. Paul, MN.

Dan Thury (BIE 99) received his MBA from the U of M - Carlson School of Management in May ’05. Had my second child, Henry, on 9/28/05. At Andersen Corp. he works in an Industrial Engineering role, and mostly as a Process Engineer for our Vinyl Blending, Extrusion, and currently in the Compounding and Pelletizing operation where we’re making a versatile wood/plastic composite material.

Todd Wanygora (BSIE 95) lives in Fort Collins, CO and works for Managed Business Solutions (contracted to Hewlett Packard). He and his wife Nicole have 2 daughters: Aspen, 4-years-old and Sierra, 2 years-old.

Dan Wilkinson (BIE 93, MIS 95) has been a welding/mfg engineer for 6 years. Now teaching at WITC. See witc.edu.

Senior Design Projects for Fall 06 (cont. from pg 2)

Curtis Oil (continued)

based on the current local traffic flows and some simplifying assumptions. A simulation model will be created and recommendations will be made based on the various findings of the team members.

Mille Lacs Wild Rice Corporation includes team members Matt Zbylut, Desi Okpetu, and Mike Freeman. The company has machinery that needs to be implemented into the post-parching process in the production of wild rice. Product that is brought in from northern Saskatchewan has a tendency to clump together and cause process flow issues due to its larger grain size. Our task is to determine the most efficient, user-friendly layout to maximize production while simultaneously reducing product breakage. The accepted layout will not only allow a throughput of 2500 lbs. of hulled wild rice an hour, it will also allow continuous flow of product without any machine idle time. A functioning line is expected by mid-November at which point we will begin our troubleshooting and optimizing stage of the project.

The formula SAE Series competitions challenge teams of university undergraduate and graduate students to conceive, design, fabricate and compete with small, formula style autocross racing cars. A senior design team composed of ME students Caleb Glantz and Kyle Undesser, IE Christian Mickelson, and John Mattson, a ME and IE student, are working in conjunction with the MIE club to design a car body for the vehicle which will compete in the 2007 formula SAE design competition in Michigan. The group was assigned the challenge for their senior design class, where in past semesters the frame and suspension were constructed. The team’s goal is to design and produce a first article for the formula SAE car body based on the suspension and frame designs. This will entail designing the body on Solid Works, as shown in the figure, constructing a foam mold, and over-molding a part of the body with either fiberglass or carbon fiber fabric using a wet lay-up process.
Department News

Dr. Emmanuel U. Enemuoh presented his paper “Designed Experimental Study of Set-Up Parameters of Acousto-Ultrasonic NDE of Adhesively Bonded Lap Joints,” at the Annual ASEE (American Society of Engineering Education) North Midwest Sectional Conference at University of Wisconsin Stout on October 5 – October 7 2006. This paper demonstrates how his research work on nondestructive evaluation techniques can be integrated into his teaching of NDE elective course at UMD.

Dr. Robert Feyen, after serving as the technical group’s Program Chair for the past two annual conferences, has been elected chair of the Human Performance Modeling technical group (HPMTG) within the Human Factors and Ergonomics Society (HFES). With close to 400 members, the HPMTG has become the 8th largest technical group in HFES after only two years in existence.


Hilal Katmale, MSEM graduate student, and Dr. David Wyrick presented their paper, "Difficulties in Fleet Management: Intangible Factors, Information Overload, and Data Integrity." Proceedings of the 2006 National Conference of the ASEM in Huntsville, Alabama.

Dr. David Wyrick has been elected to serve on the Board of Directors for the ASEM as director of the North-Central Region.


Dr. Xun Yu, R. Rajamani, K. A. Stelson, and T. Cui, “Active control the sound transmission through windows with carbon nanotube based transparent actuators,” IEEE Transactions on Control Systems Technology, accepted for publication, 2006.

Dr. Xun Yu, R. Rajamani, K. A. Stelson, and T. Cui, “Active control the sound transmission through windows with carbon nanotube based transparent speakers and noise source identifications,” 2006 American Control Conference (ACC 2006), Minneapolis, MN, June 14-16, 2006.


UMD Announces Reaching Higher Scholarship Initiative

Since 1998, each student body has successively been the largest in UMD’s history, and our documented academic excellence has been rising right along with it. But as we educate the next generation that has an inspiring passion to learn, we are aware of a critical shortfall; the need for more scholarships.

Currently, MIE is able to provide about 15 scholarships a year. Most of these are funded by annual gifts from local businesses. We only have two endowed permanent scholarships. Through the Reaching Higher Scholarship Initiative we hope to increase this number. The University has committed institutional funds to match the payout of the new endowed scholarships. For example, if $1,000 is being awarded from a new endowed scholarship fund, UMD will match that with an additional $1,000. And that doubles the chances for success of our students.

-Any gift (or pledge payable over up to 5 years) of $10,000 or more that meets program qualifications is eligible for the match.

-Gifts are used to create an endowed fund for UMD students.

A little less than five percent of the fund’s market value is paid out annually to fund the scholarship. Each year, UMD will match this payout to double the impact of the gift.

The Reaching Higher Scholarship Initiative is a great opportunity for donors to double the impact of their giving and truly help students achieve their educational goals.

For more information about the Reaching Higher Scholarship Initiative please contact Tricia Bunten, Development Director for the College of Science and Engineering, at 218-726-6995 or 1-866-999-6995 or email tbunten@d.umn.edu.
New Faculty

Dr. Robert G. Feyen joins the Department of Mechanical and Industrial Engineering after having spent the last four years as an assistant professor of Industrial Engineering at Purdue University. Robert has degrees in mechanical engineering (B.S., Calvin College, 1989) bioengineering (M.S., University of Michigan, 1994) and industrial and operations engineering (M.S.E., 1994 and Ph.D., 2002, University of Michigan). Over the past 15 years, he has conducted research in the aviation, automotive, manufacturing and healthcare settings on diverse range of topics including consumer product design, human-machine interaction, human performance modeling (including biomechanical and task analyses), industrial accident reconstruction, assistive technologies for persons with disabilities, technical documentation, and safety systems. His teaching and research interests include both cognitive and physical ergonomics as well as occupational safety, and his research focuses on modeling human performance and integrating computational models of human performance into the product and system design process.

Dr. Xun Yu joined the Department of Mechanical and Industrial Engineering as an Assistant Professor at the beginning of fall 2006, right after receiving his Ph.D. in Mechanical Engineering from the University of Minnesota – Twin Cities in August. He has also worked as a summer research intern in Seagate LLC, Minneapolis in the summer of 2006. Dr. Yu’s research and teaching interests lie in nanotechnology and control systems. In his Ph.D. study, he developed the first carbon nanotube based transparent thin film speakers (actuators), and developed active sound transmission control systems for windows using the developed thin film speakers. Currently, Dr. Yu is working on the development of carbon nanotube based devices for the detection of biological materials, such as glucose and cancer cells. He is also interested in the development of carbon nanotube based proton exchange fuel cell membranes. In the area of controls, Dr. Yu is doing research on the active noise control systems for infant incubators in neonatal intensive care units, and active vibration control for hard disk drives.

Engineering Scholarships for 2006-2007

Leadership Engineering Scholarship—Duluth Engineers Club, Andrew Schultz, Minnesota Power, Elliot Dando; MN Soc. of Professional Engineers, David Schindler, Schott Foundation, Cal Larson

Academic Engineering Scholarships—Enbridge

Energy Company, Jason Hedlund; Krech, Ojard & Associates, Colin Johnson; Oscar J. Boldt Construction, Kristen Haak

Gordon Voss Undergraduate Scholarship—Jennifer Dennison, Eromosele Okhiria

Joseph Hartmann Memorial Scholarship—Shumair Syed

L. Alden Kendall Scholarship (Alumni)—Shawn Finstrom

Mary Ann & Jerry Ostroski Engineering Scholarship—Joanna Woodward

UMD Engineering Scholarships—Ryan Bowlds, Kai Goellner, Jason Heintz, Christopher Johnson, Julianne Ropponen, Abdul Vohra
Keep In Touch

Let us know where you are working, what you have been up to, etc. Contact us via email (mie@d.umn.edu), mail (return this form), phone (218-726-6161) or fax (218-726-8596)

Name: ____________________________
Company: ____________________________
Work Address: ____________________________
Work Phone: ____________________________
Email: ____________________________
Home Address: ____________________________
Home Phone: ____________________________
Graduated (Year): ____________________________
Comments you would like to have shared in future newsletters (personal or career): ____________________________

Grad School: ____________________________
Degree: ____________ Year: ______

Please have the CSE Development Officer contact me regarding contributing to MIE scholarship funds or other donations.

Possible areas to contribute towards:
* L. Alden Kendall/Alumni Scholarship (for MIE undergraduates)
* Fred Robinson Scholarship (for MIE undergraduates)
* General engineering scholarships (for engineering undergraduates)
* Equipment (for labs or student competitions)
* Student groups (to fund competitions or conference attendance)

(return this form to: MIE, 105 VKH, 1305 Ordean Court, Duluth, MN 55812-2496)

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