PHYSICS & ENGINEERING DEPARTMENT

Elizabethtown College

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Wunderlich Earns Tenure and Promotion

Professor Joseph Wunderlich with his family

Dr. Joseph Wunderlich, Associate Professor of Computer Science and Computer Engineering, has just become the first engineer to earn tenure and promotion at Elizabethtown College. Dr. Wunderlich was recruited to Etown from Purdue University in 1999 by Professors Ferruzza and Leap. His primary reason for coming was to build and coordinate the Computer Engineering Program.

Dr. Wunderlich has three engineering degrees and previously worked for IBM as a researcher and hardware development engineer on S/390 mainframe supercomputers. Additionally, he has 12 years of research experience in robotics and machine intelligence. He founded the Elizabethtown College Robotics and Machine Intelligence Lab in which over 100 students have participated to-date. The projects and the proposed new Lab are listed on his website at http://users.etown.edu/w/wunderjt/weblab.htm. Projects include the Wunderbot II autonomous robot which entered in the national Intelligent Ground Vehicle Competition in 2004 and collaborative student research projects that led to presentations in Japan, Jamaica, and the United States.

His main areas of teaching are digital design, assembly language, and computer hardware design (from embedded systems to supercomputers); he has added many new hardware and software development platforms to support these efforts (e.g., FPGA's and 80251 microcontrollers). He also teaches a popular elective course in Artificial Intelligence and is proposing a new course in Robotics. (Continued on page 2)

Alumni and Industry Night

Steven Sturgis of Masterfoods speaks with engineering students Matt Freeborn, Mitch Deike, James Carr and Gustavo Coro.

On April 6 the department hosted a dinner, supported by Career Services and Alumni Relations, bringing together alumni, current students, and local industry leaders. Six local leaders in the engineering community joined us from Bayer Consumer HealthCare, Masterfoods USA, Rettew Associates, Inc., Phoenix Contact, and Tyco Electronics. Alumni Steve Borst, Bryan Brilhart, and Jon Batzer and 22 current students attended, along with Department faculty members. To provide alumni and local industry leaders with a taste of the current projects happening in Engineering at Elizabethtown College, Joshua Bittle ('07) (Compressed Air Energy Storage), Patrick Gianelli ('08) (Wheelchair Proximity Sensors), Jason Kreidler ('05) (ITT Industries Pressure Test System) and Thomas Yeager ('06) (Wunderbot II Autonomous Robot) each made presentations after a casual and conversational dinner.

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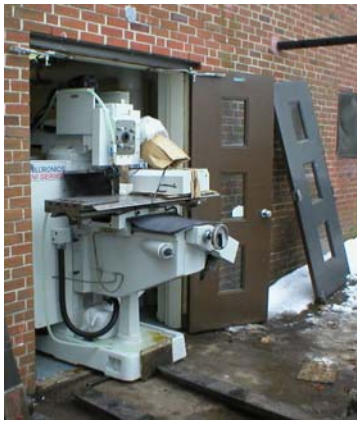
The department's Milltronics CNC 3-axis milling machine

New CNC Milling Machine

In January, the department took delivery of a new state of the art three-axis CNC milling machine. The Milltronics VKM3 gives students and faculty the capability to manufacture parts directly from a 3D computer model. The machine interfaces with our 3D Solid Edge modeling software and through the CNC code generating MasterCam software tool, accelerates the process of going from design to prototype. This capability enhance the complexity of possible projects and experience with this equipment will be valuable for graduates entering a manufacturing environment.



The new milling machine was a tight fit into the basement workshop.

2004-2005 Student Awards for Academic Excellence

Each spring semester, after the annual Physics and Engineering picnic, several awards are presented to students in the department. that excelled academically.

"Hager Scholar" is our highest distinction for returning students and is named for Nathaniel E Hager Jr., Professor Nat Hager's father. This year Christopher Yorgey, James Painter, Suman Jonchhe, Garry Brock, Duane Breneman, Mark Dinse, Michelle Doll, Robyn Dunstan, and Sudip Shrestha were designated at Hager Scholars.

The Faculty 1st year award is presented annually to outstanding first year majors in physics or engineering. Drew Graybeal, Josh Brubaker, Adam Beard, and Adam Botterbusch were presented with this award.

The Custer Award honors Hubert M. Custer, Associate Professor of Physics Emeritus, and is presented annually to an outstanding junior who is completing three years at Elizabethtown College and is beginning two years at an engineering college. Mee Mee Hein was presented with this award.

The Reber Award, funded by the Larry H. Reber Memorial Fund, is presented to outstanding graduating seniors majoring in the Department of Physics and Engineering. Jason Kreidler and Steve Sanko received this award. Steve Sanko also received Honors in the Discipline recognition.

Additionally, Robyn M. Dunstan, Michelle E. Doll, Steven M. Sanko, and Kristina F. Lott were all inducted into Sigma Pi Sigma, the physics honor society.

The Reber Award graduating seniors: Steve Sanko (L) and Jason Kreidler (R)

Wunderlich (continued from page 1)

Dr. Wunderlich, when he was clean shaven. Can you guess the year?

Dr. Wunderlich has numerous publications and is drafting a book on machine intelligence. His future plans are to continue building the Computer Engineering Program through ABET accreditation, to fund a permanent physical space for the Robotics and Machine Intelligence Lab, and return for a semester (or summer) to the University of Genoa in Italy where he has been invited to conduct robotics research (this will likely include involvement from Etown students and alumni).

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First Year Students Design, Construct Alternative Energy Storage Systems

How would you store the electrical energy generated from 15 minutes of sunlight on a solar panel for use at a later time? Now suppose you can't use a battery. That was the challenge assigned to 30 first year engineering students this spring in the Introduction to Engineering course.

The project objective was to design an energy storage system that did not use electrochemical batteries, to store energy generated during 15 minutes of sunlight on a 120-watt solar panel, and to deliver the stored energy to an electric motor after a zero- to five-minute pause. "This project specifically explores non-battery-based energy storage techniques," said Professor Troy McBride, who team teaches the course with Professor Jean Fullerton. "While batteries are widely used and moderately effective, limited lifetimes, cost, and size, as well as environmental disposal concerns compel us to explore other technologies."

Ryan Cohick demonstrates his team's pumped hydroelectric energy storage system that pumped water to the roof of Esbenshade and recovered electrical energy through a custom turbine and alternator.

For an idea of the design challenge, consider what you think it would take to store the electrical energy in terms of mechanical energy by lifting a weight with a motor. To store the small amount of energy (~108,000 J) generated in 15 minutes – you would need to lift 1000 pounds to a height of about 75 feet! – on a budget of $400.

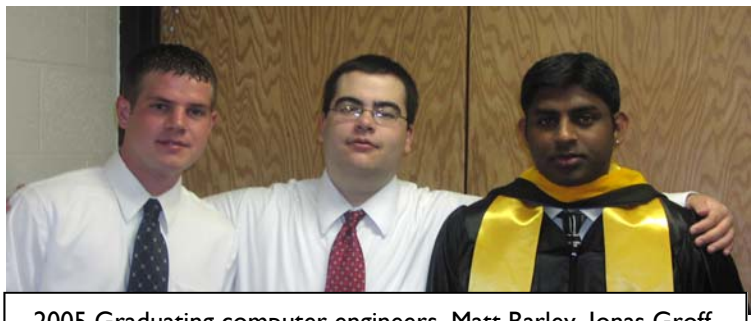
Nine teams of students completed designs, and the best five were constructed (budget of $400) by teams of six or seven students for a May 2nd demonstration. The devices included a 15-foot high, 100-gallon pumped hydroelectric setup; a 30-gallon compressed air system; a 25,000 Farad-ultra capacitor design; an 8-foot high, half-ton dual magnetic pendulum; and a high-speed induction flywheel. Project details are available at www.etown.edu/physics&engineering/projects.htm

Moving On

After graduation some students decide to go right to work, while others attend graduate school. Here's what some of our recent grads are up to. We'd love to hear from you! (Email: mcbridet@etown.edu)

2005 Highlights: Jason Kreidler, Egr Physics '05, has been accepted into a Graduate Program at University of Delaware, while Steve Sanko, Cmp Egr '05, is headed to Notre Dame — both on full rides with stipends.

Matt Barley, Cmp Egr '05, was hired as an engineer at FES Systems in York, PA and Dinesh Jeyeram, Cmp Egr '05, at Carlisle Syntec in Carlisle, PA. Gustavo Coro, Ind. Egr '05, is working at Kellogg's in Lancaster, PA.



2005 Graduating computer engineers, Matt Barley, Jonas Groff, and Dinesh Jeyeram, gather in the department before graduation.

Graduate School Updates: Rubén A. Terrazas, Ind Engineer '04, is in the Graduate Program in Mining Engineering at Penn State University (Fall 2005). Scott Murray, Engineering Physics '04, is pursuing a degree at John Hopkins in Mechanical Engineering, while continuing to work full time at CNA, Inc. in Aberdeen, MD. Other highlights include Jonathan Snively '01 pursuing his PhD in EE at PSU; Alfonso Burgoa '03 is also at PSU in a MS program for Ind Egr; Chad Vensel '03 is at Colorado State U.; Both Carrie Kerna '04 and José Riofrio '03 are pursuing their MS then PhD at Vanderbilt U in Mech E; Matthew Feshler '02 is studying at U. Conn for his MS in Mech E.

Doctors and Lawyers, Oh my!: Doug Wisner, Physics '04, is attending Penn State College of Medicine. Conrad Blease, Engineering-Physics and Philosophy '02, is attending Villanova School of Law.

Masters: Stephen Borst, '01 (PSU), Scott Weigle, '99 (U Penn), Tony Masimore '98 (U Penn), and Brian Hanuska '98 (SUNY Binghamton) have all completed masters programs.

Doctors of Philosophy!: Two graduates have recently completed programs for their PhD; they include Sue Niezgoda '96 (PSU, Civil Eng) and Jodi Raffensberger Sammarco '96 (Rutgers U, Chemical Eng).

Congratulations to everyone on all their hard work and great achievements!

Sights From Around the Department

The Spectacular Weenies softball team tradition continues — in both intramurals (Left) and in the annual game against and picnic with the Math Department. At Right, the team takes time for a group shot after the game.

The Physics and Engineering Department hosted a "Junkyard Wars" activity during this year's Dell Day. Four teams of ten students constructed human-powered chariots out of junk parts. (Left) An Upper-class team of engineering students races in the speed contest. (Right) A team of first-year engineers tests their load carrying capability (1100 lbs).

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