

in Gear

Winter 2007

EDWARD P. FITTS DEPARTMENT OF
INDUSTRIAL AND SYSTEMS ENGINEERING

Celebrating a Banner Year

2007 has been a banner year for the Edward P. Fitts Department of Industrial and Systems Engineering at NC State, the first named and endowed academic department in the history of the University of North Carolina System. We developed emerging interdisciplinary academic thrust areas, welcomed an internationally renowned department head, as well as the first holder of the Clifton A. Anderson Endowed Chair, and two other new faculty members who add breadth and depth to our current group of award-winning faculty. New faculty awards this past year include: Yuan-Shin Lee: Fellow of IIE, Thom Hodgson: Clifton A. Anderson Outstanding ISE Faculty Award, Paul Cohen: Vice Chair of IIE Council of Fellows, Russell King: Secretary of IIE Council of Fellows, Shu-Cherng Fang: Outstanding Alumnus Award, College of Science, National Tsinghua University, Jim Wilson: Reappointed Editor-in-Chief of *ACM Transactions on Modeling and Computer Simulation* and Dean Louis Martin-Vega: 2007 National Hispanic Scientist of the Year, Museum of Science and Industry.

As the department continues to make strides in achieving Top Five status with innovative contributions to healthcare delivery, logistics, ergonomics, rapid prototyping and manufacture, systems optimization and analysis and more, we anticipate next year will be as exhilarating and groundbreaking. However, as we look forward to 2008, we wanted to recap some of the highlights from the latter half of '07. We also wanted to keep you informed of upcoming events. Enjoy! ●

IT'S RAINING CATS AND DOGS...AND PANDAS?

Utilizing the department's Electron Beam Melting (EBM) system, Ola Harrysson, Ph.D. is continuing to collaborate with clinicians at NC State's College of Veterinary Medicine to explore and conduct brand new high-tech surgeries to help our furry friends. Ola is using the machine's innovative technology to design a custom plate for Pez, a beagle with a large hole in the roof of his mouth; create a highly functional prosthetic appendage for Mr. Fronz, a currently three-legged feline; and the department and vet school are still working with staff at the Shaanxi Rare Animal Rescue Center in China to assess the feasibility of providing Niuniu, an injured Panda, with an artificial limb. As we reported in the last issue of inGear, due to our research in cooperation with the vet school, the rescue center has asked for NC State University's international collaboration. ●



TOP FIVE

Our own Denis Cormier placed 5th at the Sony Ericsson City of Oaks Marathon, November 4th in Raleigh with a time of 2:56:13. The marathon's name refers to "Raleigh's historic distinction as the 'City of Oaks,' with its abundance of oak trees and calls to mind the natural areas that abound within the metropolitan capital of North Carolina." ●



Courtesy of MarathonFoto

News Nuggets:

International Flair. *Raleigh/Durham Airport has been seeing some heavy international action of late, if visits to the North Carolina State University campus are any indication. In 2007, the ISE department received visitors from the University of Rostock (Germany), Universidad de los Andes (Columbia), École Polytechnique (Montreal, Canada), Federal University of Rio de Janeiro, Federal University of Juiz de Fora, and Catholic University of Paraná (Brazil), Tsinghua University and Chinese Academy of Sciences (Beijing, China), Southern Taiwan University of Technology (Tainan, Taiwan), Hohai University (Jiangsu, China) and Deutsche Bank.*

Giving Back. *2006 Distinguished Alumnus Hugh M. Duncan, who established the department's first endowed scholarship by a single individual, used as a merit scholarship for department undergrads, has recently added a significant amount of money to the Duncan scholarships. South Carolina-based Tindall Corporation made a donation to help renovate the student lounge. Ms. Stephanie Frankie, Process Engineer (2005 BSIE NC State graduate) and Mr. Danny Faucette, Director of Industrial Engineering were both on hand to present the check to Department Head Paul Cohen. Dr. Cohen and the entire ISE department would like to extend our gratitude to all of our donors!*





WELCOMING NEW FACES

In addition to the recently announced arrivals of Edgar S. Woolard Distinguished Professor and Department Head Dr. Paul H. Cohen and inaugural Clifton A. Anderson Distinguished Professor Dr. Reha Uzsoy, we would like to formally “introduce” Assistant Professor and Fitts Faculty Fellow Brian (Trevor) Denton and Assistant Professor and Fitts Faculty Fellow Julie Simmons Ivy.



Prior to joining NC State, Dr. Denton was a Senior Associate Consultant at the Mayo Clinic, and an Assistant Professor in the Mayo College of Medicine in Rochester, Minn. Since joining Mayo Clinic in 2005, his research interests have focused on the development of new models and methodology for optimization of healthcare delivery and medical treatment decisions. Prior to joining the Mayo Clinic, he was a Senior Engineer at IBM from 2001-05. His general research interests are in the application and development of solution methodology for large-scale optimization problems arising in industry applications. He has a joint BS in Physics and Chemistry, an MS in Physics, and a Ph.D. in Management Science from McMaster University. Dr. Denton will be teaching ISE 501 Introduction to Operations Research in spring '08. ●

Dr. Ivy received her BS and Ph.D. in Industrial and Operations Engineering at the University of Michigan and her MS in Operations Research at Georgia Tech. Prior to joining the NC State faculty, she spent several years on the faculty in Operations and Management Science at the Stephen M. Ross School of Business at the University of Michigan. Her research interests are mathematical modeling of stochastic dynamic systems with emphasis on statistics and decision analysis as applied to healthcare, manufacturing and service environments. The focus of her research is decision-making under conditions of uncertainty with the objective of improving the decision quality. Her research program seeks to develop novel concepts of maintenance and monitoring policies and associated scientific theories, such as partially observable Markov decision processes, and apply them specifically to the two important application domains of industrial and medical decision-making. Dr. Ivy taught ISE 760 Applied Stochastic Models in IE this past fall and will be working on numerous research efforts in the spring. ●



HONORING OUR DISTINGUISHED ALUMNI

This past October, the department held a luncheon reception to honor its second group of Distinguished Alumni, as well as students, faculty, and staff. The Distinguished Alumnus Award is the highest honor the department can bestow upon any graduate and is presented to individuals whose contributions to their profession, community and the department, college and/or university are notable and merit special recognition. 2006 Distinguished Alumnus Edgar S. Woolard, former Chair of the Board of Directors, President and CEO of DuPont was the keynote speaker. Woolard regaled attendees with an abridged yet captivating recap of his journey from a shy scholar first stepping foot onto the NC State campus to head of what was then a Fortune 15 company and beyond. Among the 2007 Distinguished Alumnus class was Rajendra K. Pachauri (M.S.I.E. '72 and Ph.D. '74), who was nominated as one of Time magazine's most influential people in the world for 2007 and shared the 2007 Nobel Prize for Peace as Chair of the Intergovernmental Panel on Climate Change (IPCC). Pachuri, who was unable to attend, will be presented with his award in February when he returns to NC State for an Emerging Issues Forum. Also honored were: V.B. Lougee, III (B.S.I.E. '51), N. Clark Hatcher, Jr. (B.S.F.M.M. '52), John V. Andrews (B.S.I.E. '55), C. Robert Rhodes (B.S.I.E. '60), E. Emory Ensore, Jr. (B.S.I.E. '65), Thomas D. Pearson (B.S.F.M.M. '65), Kenneth D. Franklin (B.S.I.E. '71), Gayle S. Lanier (B.S.I.E. '82), and Tim Scronce (B.S.I.E. '87). The October 4th event was the largest single gathering to date of NC State ISE alumni. ●

On the Cutting Edge of Innovation

To continue to stay on the forefront of ISE, the department has developed three interdisciplinary thrust areas that will ensure our graduates are poised to become successful thought leaders, contributors and innovators in such a rapidly growing field.

*The multidisciplinary **Biomedical Manufacturing Systems Engineering** thrust focuses on 3-D modeling, bioinformatics, surgical machining, pharmaceutical production, image processing, physiological signal processing, and biomechanics, and requires engineers to collaborate extensively with physicians, therapists and many other professionals in the medical and biotechnology sectors.*

*The provision of healthcare is one of the United States' most difficult challenges as more and more of our citizens are losing access to desperately needed medical resources. The **Health Systems Engineering** thrust focuses on how to improve the organization, delivery and cost effectiveness of healthcare so that it can meet our nation's increasing demands.*

*A growing international economy has transformed the movement of materials, products, labor and services into a much more intricate and complicated process. The **Logistics Systems Engineering** thrust focuses on improving the performance of the complex systems that keep the world moving.*



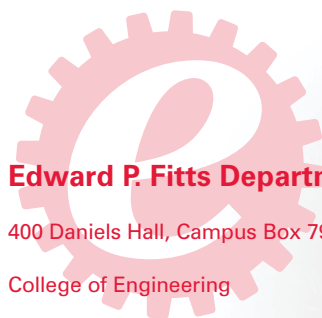


SEE YOU AT THE NEWSTAND

The US Industry Today Web site posted the news that “New Electron Beam Melting System is Up and Running and Taking NC State Department of ISE to New Heights” and parenting magazines across the country continued to clamor for ergonomics tips from The Ergonomics Center of North Carolina, an integral part of the Edward P. Fitts Department of Industrial and Systems Engineering. *Carolina Parent* ran an article in its August issue entitled, “Oh, My Aching Back – Teach children proper computer work habits to minimize aches and pains down the road,” and HealthNewsDigest.com, a Web site that provides current and breaking news on health, science and technology, medicine and the environment, published the list of ergo tips for kids, citing the ISE department as a source of the information. The HealthNewsDigest.com network delivers an estimated 30 million impressions a month to consumers seeking the latest health news. An “ergonomics for kids” interview also commenced between an expert at The Ergonomics Center of North Carolina and Dominion Parenting Media. Dominion’s publications include: *L.A. Parent, Our Kids San Antonio, The Boston Parents’ Paper, Bay Area Parent, Colorado Parent, Westchester Family.* ●

MARK YOUR CALENDARS

More information will be forthcoming, but we wanted to let you know about a few planned 2008 events. A Graduate Student Recruiting event is slated for January 17th and 18th, 2008. The aforementioned Emerging Issues Forum will be held on February 12, 2008 and Dr. R.K. Pachuri will receive his Distinguished Alumnus Award at a corresponding reception. The department will also host a Health Systems Engineering Symposium April 6 - 8, 2008. The theme is “The Interface of Health Services Research and Healthcare Engineering.” ●



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IE Methods Will Get Senior High School Math Students in Proper “MINDSET”

Dr. Robert Young, a professor of ISE at NC State is the principal investigator for a \$3 million National Science Foundation grant to researchers at NC State University, Wayne State University and the University of North Carolina at Charlotte to fund development, testing and implementation of an innovative math curriculum, Mathematics Instruction using Decision Science and Engineering Tools

(MINDSET). The program was borne in direct response to a call by universities and state departments of education to boost poor proficiency skills among American students.

The MINDSET curriculum presents hypothetical yet common engineering challenges in business to make math relevant and comprehensible to students. According to Young, “Making math relevant to students will improve their attitude toward it and make them better prepared when they enter the workforce – or the university.”

For more information on this exciting initiative, logon to:

<http://news.ncsu.edu/>

news/2007/10/169mkmindset.php

