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Department of Industrial Engineering

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Supervising Aircraft Maintenance

The safety of air transport depends upon effective supervision of aircraft maintenance operations. With the support of a half-million dollar research grant from the Federal Aviation Administration, Dr. Joel Greenstein and three of the IE Department's doctoral students, are working with industrial partner FedEx to develop a Web-based Surveillance and Auditing Tool (WebSAT). This tool will enable consistent and comprehensive supervision of aircraft maintenance operations. WebSAT will also standardize the collection of maintenance data so that airlines can benchmark their operations with each other.

The research will take place over a three-year period and follows the principles and methodologies of user-centered design. Currently, the project team is conducting a series of worksite observations and interviews with FedEx associates to understand the nature and context of their work. The team plans to complete the design and development of a WebSAT prototype by the end of 2005. Trial implementation, testing, and refinement of the tool will take place in 2006.

Improving IE Education

Mary Beth Kurz, Del Kimbler, Anand Gramopadhye and former department member Michael Leonard (now senior associate dean of the School of Engineering at Mercer University) have developed a new scalable and deployable Industrial Engineering baccalaureate-degree renewal model, funded by the National Science Foundation (EEC-0229093), which resulted in the revision of one of the department's IT courses, IE 220: Design of Information Systems in Industrial Engineering. One of the more visible changes is that IE 220 requires laptop, which has completely changed the way it is taught. Since the modification, over 60 students have taken the revised course over two terms. A group of 31 faculty members from 27 different universities across the United States participated in a review of the curriculum planning process and its application in revising the IT course.



The curriculum renewal model highlighted the need for decision support system (DSS) courses, resulting in the creation of IE 440: Systems and Information. Mary Beth Kurz and Del Kimbler are collaborating with Ravindra Ahuja of the University of Florida on a recently funded NSF project (DUE-0340984) to develop course material to teach DSS skills and technologies to undergraduate industrial engineering students, which will be used in course offerings at the University of Florida and Clemson, as well as other universities. The Clemson team members are developing learning objectives for the modules based on Bloom's Taxonomy as well as methods by which the course material and student performance can be assessed in light of the learning objectives. Mary Beth Kurz participated in a panel on the assessment of DSS courses at the NSF-sponsored workshop, Developing Spreadsheet-Based Decision Support Systems held at Amelia Island Plantation in August 2004.

Message from the Department Chair

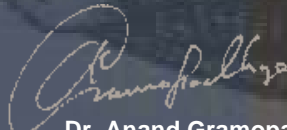
This issue highlights our current focus on improving industrial engineering education, an effort driven by the faculty and funded by the National Science Foundation. You may be interested to know that the Department continues to grow; we currently have 160 undergraduates and 65 graduate students of whom 21 are pursuing doctoral degrees. Most impressive is the fact that last year, four of our doctoral graduates were placed in academia.

The faculty continues to be active in pursuing research and scholarship. During the last couple of years we have seen a significant growth in research funding. This has resulted in a demand for quality research space. To this effect, we have refurbished existing laboratories, and these renovations are highlighted in this issue. In addition, this year the Department welcomes Dr. Kevin Taaffe who joins us from the University of Florida. His background in simulation and supply chain clearly fits with the Department's strategic focus area.

In conclusion, I would like to congratulate Mr. Carl Klebe for winning the 2004 Clemson IE Alumni of the year Award. During his 40-year career, Carl has held leadership positions in industry, serving as the Vice President for Manufacturing for Ryobi Motor Products. He has been an ardent supporter who has worked tirelessly for this Department, serving on the Industrial Advisory Board for more than a decade.

We thank you, our alumni and friends for your generous support over the years. We truly appreciate your contributions to the department. I encourage you to visit our Web site at www.ces.clemson.edu/ie — and please do visit us if you happen to be in the area.




Dr. Anand Gramopadhye

IE Welcomes Dr. Taaffe

It is our pleasure to announce that Dr. Kevin M. Taaffe has joined the Industrial Engineering faculty at Clemson University.

After receiving his B.S. (1988) and M.S. (1990) in Industrial Engineering from the University of Illinois at Urbana-Champaign, Dr. Taaffe began his professional career at American Airlines Decision Technologies (AADT), now known as Sabre. He worked on transportation consulting projects using simulation, operations research, and various decision support techniques. Clients included American Airlines as well as many transportation companies worldwide. He spent eight years with AADT and Sabre, serving in roles from consultant to senior project manager.

In 1998, Dr. Taaffe decided to return to academia by working as an instructor in the Department of Industrial Engineering at Northern Illinois University. He gained valuable teaching experience for two years before pursuing his Ph.D. in Industrial and Systems Engineering at the University of Florida. At Clemson, he plans to conduct research primarily in the areas of production and inventory management, transportation and logistics systems analysis, and supply chain systems.



Focus on Faculty

Prized Professor

William G. Ferrell, Jr., associate professor of Industrial Engineering and director of the supply chain engineering and optimization laboratory has been selected to receive the prestigious Medallion Award from the Institute of Industrial Engineers (IIE).



The national award recognizes individuals who have made a notable impact on the industrial engineering profession and was presented at the Honors and Awards Banquet during the IIE annual conference in Houston on May 17.

Ferrell is a Department Editor for IIE transactions, the premier referred journal in the field. He is also on the editorial boards of two other highly regarded journals, Computers and Operations Research and the International Journal of Production Economics. He served as the IIE Director of Professional Registration for four years, where he was responsible for the industrial engineering professional engineering examination, and led a two year effort to revise the technical specification for the exam.

Ferrell and his graduate students conduct research on modelling and optimization to improve production processes, especially integrated issues related to supply chain. Recently, they have been exploring ideas related to solving practical problems with multiple conflicting objectives. Ferrell received his bachelors degree from Wake Forest in Physics, his masters degree from Virginia Tech in nuclear engineering, and his doctoral degree from N.C. state in operations research.

Quality and Discovery

Design, Control, and Optimization

Murphy's Law says that "anything that can go wrong will go wrong" and this is usually regarded as bad news. If you think about it though, it is not really bad news but it is good news. Murphy's Law essentially indicates that the day-to-day operation of the system itself can help tell us what is wrong with it. Another way of saying this is that "every system supplies information on how it can be improved and if we use that information it can be a source for continuous improvement".

It is being increasingly recognized that a high quality of products and services and their associated customer satisfaction are the key to survival for any enterprise. Designing for quality, in particular, has proven to be a key concept, helping many US companies not only to improve product quality but also to reduce costs. A systematic and efficient way to meet this challenge requires the correct implementation of appropriate methods. That is where Clemson's Advanced Quality Engineering Laboratory (AQEL) steps in.

The four major missions of AQEL are education, scientific discovery, technology development, and transition to applications by conducting research to discover scientific knowledge and technological solutions that strengthen the leadership in a wide variety of areas of quality engineering. In more forward-looking terms, it addresses the quality of life in the information-rich environment of the future.

The goal of AQEL is to solve real problems with rigorous approaches for correct implementation. The result is that clients are provided solutions to their important problems and graduate students receive an outstanding research and educational opportunity. The key research areas of AQEL include design for six sigma, robust design, tolerance design and synthesis, design of experiments, statistical process control and reliability engineering. The AQEL has developed a number of new methods and aggressively pursues cutting-edge research which will bring value to the society by laying the foundation for tomorrow's technological breakthroughs. For more information on AQEL, please contact Dr. Byung Rae Cho (864-656-1874, bcho@ces.clemson.edu).

Industrial Engineering Awards



The Clemson Industrial Engineering Department recognized its best at the 2004 Annual Awards Banquet. The awardees are listed below.

Outstanding Senior

James Robert Glenn, Jr.

Outstanding Junior

Jill Anne Howard

Senior Academic Achievement

Mary Joyce Runkle

Junior Academic Achievement

Sarah Alice Canterbury

Sophomore Academic Achievement

Ashley Nicole Potts

IIE Award of Excellence

Liam John Cahalane

Outstanding Graduate Research

Pallavi Dharwada

Outstanding Graduate Teaching Assistant

Madhumohan Govindalluri

Professor of the Year

Dr. Mary Beth Kurz

Seeking Nominations - 2005 Clemson IE Alumni of the year

Clemson's Department of Industrial Engineering will recognize alumni who have had a notable impact on the IE profession. The recipient will be invited to the department's Honors and Awards Banquet in April to accept the award.

The nomination deadline is March 2, 2005. Please take the time to nominate a worthy candidate by going on-line to www.ces.clemson.edu/ie/people/alumni.htm



Pictures of recent research poster competition.

Poster Competition

Department of Industrial Engineering students bagged three awards at the Research Poster Competition organized by the Clemson University graduate school in conjunction with the "Focus on Research Week." Mary Runkle (BS - Calhoun Honors College) received third place for her poster titled "Problem-Based Search Methods for Flexible Flow Lines" in the Calhoun Honors College Competition. Sajay Sadasivan (PhD candidate) and Paris Stringfellow (MS student) received honorable mention in the CoES graduate student poster competition for their poster titled "Virtual Reality as an Instructional Tool for Aircraft Maintenance Education." Pallavi Dharwada (PhD candidate) received honorable mention in the CoES graduate student poster competition for her poster titled "Effect of Multiple Noise Sources on Decision Making Performance in a Visual Inspection Task."

New Facilities



Freeman 138 and 140 (the IE design studio and lab) have been completely refurbished with laptop-friendly furniture and 7 flatpanel computers for our students.

"Facilities in 138 and 140 have significantly improved the computing and learning environment. It is also a great meeting place." says Liam Cahalane, IE student.

Pictures of Freeman 138 and 140.

IE Alumni of the Year

Mr. Carl Klebe, (BS '72 ME, MS '95 IE) of the Industrial Engineering program was awarded the 2004 Industrial Engineering Alumni of the year award. Klebe during his 40 year career has served as Vice President of Manufacturing for Ryobi Motor Products and has worked on everything from application of plastics to replace metals as structural components in consumer products to integrating engineering documentation with manufacturing planning and execution systems. Under his leadership, a multinational team developed new products and manufacturing process. Klebe's Clemson IE connections remain strong. He is currently serving his 12th year as a member of Clemson's Industrial Engineering Industry Advisory Board, and his granddaughter is a clemson freshman who plans to major in IE.



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