*E*ngineering ENTERPRISE

THE ALUMNI MAGAZINE FOR ISyE AT GEORGIA INSTITUTE OF TECHNOLOGY

Fall 2006

THE
H. MILTON STEWART
SCHOOL OF INDUSTRIAL AND SYSTEMS ENGINEERING

ENDOWED THROUGH THE GENEROSITY OF
CAROLYN J. AND H. MILTON STEWART, IE 1961

EVERY IMPORTANT ENDEAVOR BEGINS WITH THE LEADERSHIP OF
VISIONARY INVESTORS. THE VISION SHARED BY MILT AND CAROLYN
STEWART AND THEIR FAMILY WILL CARRY THE SCHOOL OF INDUSTRIAL
AND SYSTEMS ENGINEERING TO EXTRAORDINARY HEIGHTS OF
UNPRECEDENTED ACADEMIC DISTINCTION. THEIR SELFLESS
GENEROSITY ENSURES FUTURE GENERATIONS OF STUDENTS AND
FACULTY UNPARALLELED EDUCATIONAL AND RESEARCH
OPPORTUNITIES, UPHOLDING GEORGIA TECH'S LEGACY AS THE
INTERNATIONAL LEADER IN INDUSTRIAL AND SYSTEMS ENGINEERING.

DEDICATED 2006

- **Alumnus Names the H. Milton Stewart School of Industrial and Systems Engineering**

- **SciHealth Offers "IE-Style" Healthcare Solutions**

- **Health Related Activities in the H. Milton Stewart School**

The H. Milton Stewart School of Industrial and Systems Engineering

by Chelsea C. White III

As we were going to press for the last issue of the *Engineering Enterprise*, one of our alumni, Milt Stewart, committed $20 million to the School of Industrial and Systems Engineering. We are proud to be called the H. Milton Stewart School and are very appreciative of the resources that Milt has committed that will enable our faculty to have greater impact on the academic and research communities, the pool of future knowledge workers, and the problems toward which our research is directed. There is further detail in an article that describes the commitment ("Alumnus Names the H. Milton Stewart School of Industrial and Systems Engineering") and further background in the interview with Milt Stewart, also contained in this issue ("Q&A with Milt Stewart").

In highlighting Milt's commitment, it is worthy to note how aligned the Stewart School is to the "… continuous research and innovation, guided by a strong regard for pragmatism and relevance …" that Milt mentions in his interview. This alignment was particularly apparent during a recent Stewart School faculty off-site meeting, which focused on how to adjust to the changing research and development landscape. The meeting described two specific trends identified by the National Science Foundation (NSF) and other funding agencies:

Collaborative research. High impact research being funded is increasingly being conducted collaboratively. Discovery requires the expertise of individuals from different disciplines, with diverse perspectives, working together to accommodate the complexity of today's science and engineering challenges.

Economically and socially relevant research. Science and engineering are having increasingly significant economic and social impact. Research interest and funding is increasingly being directed toward global challenges, such as emerging infectious diseases, natural hazards, and the need for alternative energy sources.

A challenge the faculty faces is how to leverage our extraordinary disciplinary expertise into leadership, i.e., higher impact roles for collaborative research on economically and socially relevant issues. The specific issues examined during the meeting were disaster relief, healthcare delivery systems, sustainability, energy and the environment, medical operations research, biostatistics, nano-manufacturing, and security. An article on the Stewart School's involvement in health systems ("Health-Related Activities in the H. Milton Stewart School") provides detail about faculty members' activities in health systems education and research. These issues are consistent with goals of the College of Engineering Strategic Plan, one of which is to develop centers of excellence in areas of global importance, such as health, security, energy, and the environment. What the Stewart School faculty has is significant – in some cases, dominant – technical expertise to marshal in many of these areas. Consistently across all of these issues was a need for problem domain expertise and relationships with potential resource providers. This suggests a need for a transformative expansion of our core competences to include domain expertise and concomitant contacts with potential resource providers, in addition to our internationally renowned, and in many cases unparalleled, technical competences. A topic for future strategic planning is determining how to best draw these competences into the Stewart School's core competency set while remaining the dominant source of technical expertise internationally.

Also in this issue, you will find an article introducing you to our new director of Development, Nancy Sandlin. Nancy has been with us for almost a year now and is distinguishing herself as a superb contributor to the School. *e*

Summer in Singapore

By Harvey Donaldson, Director, The Logistics Institute (TLI)

Merlion, Singapore

Images courtesy of JupiterImages Corporation

The Logistics Institute (TLI) started Fall Semester with a full schedule of seminars, industry research projects, new graduate students, and international visitors. As I write this column in early September, I feel like the elementary school boy whose first assignment for the new school year is to write a theme on "My Summer Trip." For the TLI faculty and staff, summer is the time for vacations, but also the time for practicing the "global" part of our global logistics mission. The summer of 2006 found many of us scattered around the world studying global supply chains and expanding TLI's programs and visibility around the world.

Just as spring semester ended, former Provost Jean-Lou Chameau, Vice Provost Charles Liotta, Stewart School Chair Chip White, and I traveled to Singapore for our annual meeting with the TLI Asia Pacific Industry Advisory Board. The meeting showcased the excellent relationships that we have with many multi-national companies in Singapore, as well as TLI Asia Pacific's outstanding education and industry research programs. While in Singapore, we also discussed TLI Asia Pacific's future growth as well as opportunities for Georgia Tech to expand its Singapore programs beyond global logistics. This late spring visit began summer-long interactions with our Singaporean colleagues. Later in May, National University of Singapore Professor Ek Peng Chew, a Georgia Tech alumnus, arrived in Atlanta as a TLI Visiting Scholar for the summer term, and TLI AP Executive Director Bob DeSouza came to Tech in late August for our semi-annual planning session.

I returned from Singapore via Shanghai, China, where I linked up with Stewart School Associate Professor Chen Zhou. Chen was just beginning his third summer leading a successful Asian Study Abroad Program for Georgia Tech undergraduate students studying in Beijing and Singapore. But our purpose in Shanghai was to continue discussions with Shanghai Jiao Tong University (SJTU) officials about a new Georgia Tech MS industrial engineering program in Shanghai. We anticipate that this new dual degree program with SJTU will begin in May 2007. Most of the courses for the Georgia Tech degree will be taught on the SJTU campus by Stewart School faculty during the summers. Additional courses will be taught by video link from the Georgia Tech campus. We believe that the opportunity for Stewart School faculty to spend time on the ground in Shanghai will greatly expand our knowledge of China logistics

Cape Town, South Africa

Shanghai, China

and provide many opportunities for interacting with multi-national companies. Stewart School Professor Ellis Johnson has agreed to lead the SJTU program. Ellis's experience and knowledge of China will be very important to the success of the program.

In late June, Professor John Bartholdi traveled to South Africa to lecture in a logistics conference in Cape Town. John's visit was a continuation of TLI's relationship with the Council of Science and Industry Research (CSIR) in South Africa. While there, John pursued his personal interest in African logistics issues including global beverage distribution and used clothing distribution (which perhaps surprisingly is a thriving global business). Upon his return to Atlanta, John chaired a week-long workshop on global wine distribution. During the week, John organized a series of lectures by academic visitors from Chile and South Africa as well as meetings with Atlanta-based wine importers, distributors, retailers, and restaurateurs. The next time you see John ask him how a South African cabernet ends up on your dining table or how a Russell t-shirt, manufactured in Asia from United States cotton, is ultimately sold in a used clothing market in South Africa.

In early July, I traveled to Geneva, Switzerland, to participate in a United Nations meeting at the historic Palace of Nations. The meeting brought together academic and industry experts from around the world to discuss the role of logistics in global trade. The audience was primarily drawn from trade representatives from UN member countries who are posted in Geneva to participate in bi-lateral and multi-lateral (World Trade Organization) trade negotiations. The meeting emphasized (1) the importance of logistics efficiency to a country's economic performance (the United States spends less than 10 percent of its GDP on logistics while many developing countries spend more than 20 percent) and (2) the constraints on free trade and global logistics efficiency resulting from national transportation and postal monopolies and regulations.

In early August, Professor John Langley was in Shanghai, China, to chair the Council of Supply Chain Management Professionals (CSCMP) China Conference: The Evolution of Logistics & Supply Chain Management in China. John, a former president of CSCMP, was asked to chair this inaugural CSCMP event in China and performed a great job of organizing and chairing the conference. John does an outstanding job of serving CSCMP and representing TLI and Georgia Tech in the global logistic industry.

Just to demonstrate that not all global logistics events occur in far away exotic locations, TLI executive director Don Ratliff attended the mid-summer Supply Chain Thought Leadership Roundtable in St. Louis. Unfortunately, the conference began just at the end of St. Louis' severe heat wave, complete with power outages. In spite of the oppressive summer heat, this annual meeting brought together academic leaders from major business schools around the world to discuss cutting-edge supply chain strategic issues. The event provides TLI with opportunities to build relationships with business school colleagues around the world. This year, Don caught up with Columbia University Professor Fangruo Chen, who has just been named Dean of the business school at Shanghai Jiao Tong University. Don's relationship with Dean Chen will provide us with an important link in building our future programs at SJTU.

We are all now back on the Georgia Tech campus and resuming/continuing TLI's many programs and activities. We look forward to your visits to Georgia Tech and the many opportunities that we will have this year to host meetings and interact with those of you who have interests in global logistics and supply chain management. *e*

Geneva, Switzerland

Alumnus Names the H. Milton Stewart School of Industrial and Systems Engineering

The School of Industrial and Systems Engineering (ISyE), ranked No. 1 in the country for the past 16 years by *U.S. News and World Report*, has received a commitment of $20 million from H. Milton Stewart, BIE 1961, and his wife Carolyn Stewart.

The commitment establishes a permanent endowment, the income from which will be available for unrestricted use within ISyE.

The school has been named the H. Milton Stewart School of Industrial and Systems Engineering in recognition of the Stewarts' commitment. H. Milton Stewart School of Industrial and Systems Engineering becomes the fourth named academic department in the Georgia Tech College of Engineering, joining the George W. Woodruff School of Mechanical Engineering, the Daniel Guggenheim School of Aerospace Engineering, and the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University.

"The opportunities presented by a commitment of this magnitude are nothing short of amazing," said Chelsea C. White III, the H. Milton and Carolyn J. Stewart School Chair in ISyE. "I look forward to working with our faculty, staff, and administration in determining how these funds can best be used to build upon the school's long tradition of innovation, research and educational excellence, and academic leadership."

The highly visible *U.S. News & World Report* college rankings have placed H. Milton Stewart School of Industrial and Systems Engineering in the nation's No. 1 slot in industrial and manufacturing engineering for 16 of the past 17 years. The Stewart's commitment will be instrumental in helping the school maintain and increase its national prominence.

"You can't have the nation's No. 1 ISyE program for this many years without strong private, philanthropic support from alumni and friends, corporations, and foundations," said College of Engineering Dean Don P. Giddens. "Sustaining the unparalleled quality of the school's research programs and the excellence of its faculty and student body takes ongoing, significant investment. We are very fortunate that Milt Stewart has always understood that need and offered his wholehearted support of ISyE."

In addition to a gift of $2.5 million that has already been made, the Stewarts' commitment consists of two charitable remainder annuity trusts totaling $7.5 million that have recently been established and a third charitable remainder annuity trust of $10 million that will be established in the near future. The Stewarts will receive income from the trusts until December 2015, when the trust assets will be transferred to the endowment, whose estimated value will be at least $20 million.

"We were thrilled seven years ago when the Stewarts created the first School Chair in Georgia Tech history, a visionary step that helped secure the finest leadership available for the School," said Georgia Tech President Wayne Clough. "Now, with this wonderfully generous commitment, Milt and Carolyn have ensured the ongoing momentum and prestige of the school they love so much for many years to come."

Stewart has a long history of philanthropy at Georgia Tech. He established the H. Milton Stewart Endowment Fund for ISyE Programs in 1995 and the H. Milton and Carolyn J. Stewart School Chair in ISyE in 1999. He has supported scholarships for women students coming to Georgia Tech from Habersham High School.

Stewart is retired chairman and CEO of Standard Group Inc., a company he established in 1987 with his sister, Kay Swanson, in Cornelia, Georgia Holdings of the Standard Group at that time included Standard Telephone, which Stewart's father, H. M. Stewart Sr., purchased in 1939. Arkansas-based Alltel purchased Standard Telephone in 1998.

In addition to receiving his bachelor's degree in Industrial Engineering from Georgia Tech in 1961, Stewart later went on to receive his MBA from Emory University. Stewart is a trustee emeritus of the Georgia Tech Foundation, emeritus member and former chairman of the ISyE Advisory Board, former member of the College of Engineering Advisory Board, and a former president, trustee, and Executive Committee member of the Georgia Tech Alumni Association. *e*

Stewart Honored with IIE Presidents' Award

H. Milton Stewart has been honored as one of five recipients of the Presidents Award by the Institute of Industrial Engineers (IIE). The Presidents Award, established in 2006, is bestowed on those who have committed significant resources to name leading industrial engineering departments or schools.

Q&A with Milt Stewart

EE: You and your wife have chosen to put your names on what *U.S. News & World Report* **ranks as the best industrial engineering program in the country. What was your reasoning when you chose to make this investment?**

MS: Aside from clichés, such as "wanting to put something back"—which certainly is very true—we are extremely proud of the Georgia Tech School of Industrial and Systems Engineering for all it has accomplished and for its bright future. Many people have contributed to ISyE's success, and we feel most fortunate to become a somewhat significant part of this great program. To have our name associated with the school is a thrill beyond belief for us.

EE: What do you see as the future of industrial engineering?

MS: Industrial engineering has evolved since I was a student and is still evolving to meet the changing times. Forward thinking ISyE leadership has enlisted the business community through its alumni to help develop a forward-looking curriculum that is designed to address today's concerns and tomorrow's needs.

In the late 1950s, I found IE to be just about right for me in my pursuit of a telecommunications career. Telecommunications may sound like it is a long way from the manufacturing floor, but the diversity and flexibility of the ISyE curriculum placed me on sound footing to become quite successful at my chosen profession, and it also gave me the foundation to finish number one in my Emory MBA class.

In the 21st century, IE has served my son very well in the healthcare industry. He established a start-up enterprise several years ago that focuses on applying quality control techniques and software to healthcare. His biggest problem has been keeping up with an accelerating demand for his company's services…a very nice problem to have. He estimates that his business doubles each year. If you ask Jeb what he does for a living, he may tell you that he saves lives. And he does. (For more on Jeb Stewart and SciHealth, please see page 10.)

So aside from manufacturing, we see two examples of industrial engineering being applied to other segments of our economy. Logistics appears to be the hot topic now as manpower, materials, and information are moved efficiently across our nation and the world to meet market requirements. These are exciting times for industrial engineering.

EE: How would you like to see The H. Milton Stewart School of Industrial and Systems Engineering respond to this vision of the future?

MS: I would just like to see ISyE "keep on keeping on." To use yet another cliché, "if it ain't broke, don't fix it." And Georgia Tech ISyE, in my opinion, ain't broke. It appears to be modeled for success with continuous research and innovation guided by a strong regard for pragmatism and relevance.

EE: You and your wife funded the first School chair at Georgia Tech, which is held by the H. Milton Stewart School of Industrial and Systems Engineering Chair Chip White. What was your motivation for that commitment?

MS: Prior to the last capital campaign, school chair John Jarvis was beating the bushes for donations. I responded as best I could at the time and told John that if I ever sold my company, I would like to do something really significant. In January 1999, I sold my company and John gave me a call asking me to join him for lunch. As we sat down to eat our pizzas, I said "John, I'll make this easy for you. How much do you want and when?" His eyes opened wide and his mouth dropped. Then, he responded by saying he would like me to fund a chair, and I agreed. That evening, Raymond Reynolds, who worked for John in ISyE Development at that time, called and asked me to fund the first school chair at Tech, and I agreed. He pushed my hot button when he said "first."

Later, John said he wished he had asked for more, so he came back with a proposal for naming the school. It never left

Milt and Carolyn Stewart at the School announcement ceremony on March 3, 2006.

my mind and it took me several years to get in shape to do it, but we finally got it done.

EE: You are leaving a powerful and meaningful legacy by naming the School. How would you like future students and faculty to remember you and your commitment?

MS: I like the fact that I am a country boy from the hills of north Georgia who got a good start in the business world by attending IE at Georgia Tech and working hard to overcome a personal intellectual deficit. My Dad inspired me to carry on the family business in telecommunications and the rest was just knowing "when to hold them and when to fold them." (I'm the cliché champ, am I not?) There was nothing especially glamorous about my life, but it was a fun time. If I am to be remembered for doing anything outstanding, it should be that I married a wonderful mother to my two fine children.

EE: Georgia Tech has grown from a good regional engineering school to an internationally respected technological university since your student days. As an active alumnus, what is the thing (or things) you are most proud of at today's Georgia Tech?

MS: Today, the North Avenue Trade School—a.k.a. Asphalt Jungle—that I attended has evolved to be recognized globally. ISyE, for one, has institutes in Singapore and China. Georgia

Tech has achieved academic acclaim, won athletic championships, continued to expand its research program, and has a beautiful, growing campus inside the empire city of the Southeast. Wayne Clough has done a magnificent job of mobilizing his available resources to transform the campus and to further boost the image of Georgia Tech. That comes as no surprise. After all, Wayne is a Ramblin' Wreck from Georgia Tech.

EE: Why did you originally decide to attend Georgia Tech? And why IE?

MS: I decided to attend Georgia Tech when Dean Griffin visited my high school on "college day," along with other college recruiters. I went to the classroom assigned for Georgia Tech prospects because I wanted to find out about the college in the big city 70 miles from my home that offered electronic courses and beat Georgia every year. Just a half-dozen students, all boys, attended Dean Griffin's session. He looked us over and said, "Tough boys, huh? Think you are tough enough to go to Tech, do you?" He challenged us. I was sold…and became the only one of the half dozen that attended Dean Griffin's session who attended Tech.

Although I enrolled as an electrical engineer, I soon tired of tumbling numbers in the first several EE courses and was not especially interested in generators and electric transmission lines. I had constructed an outlaw low-power AM radio station and worked on telephone line crews during high school. My love was the outdoors and telecommunication facilities. I
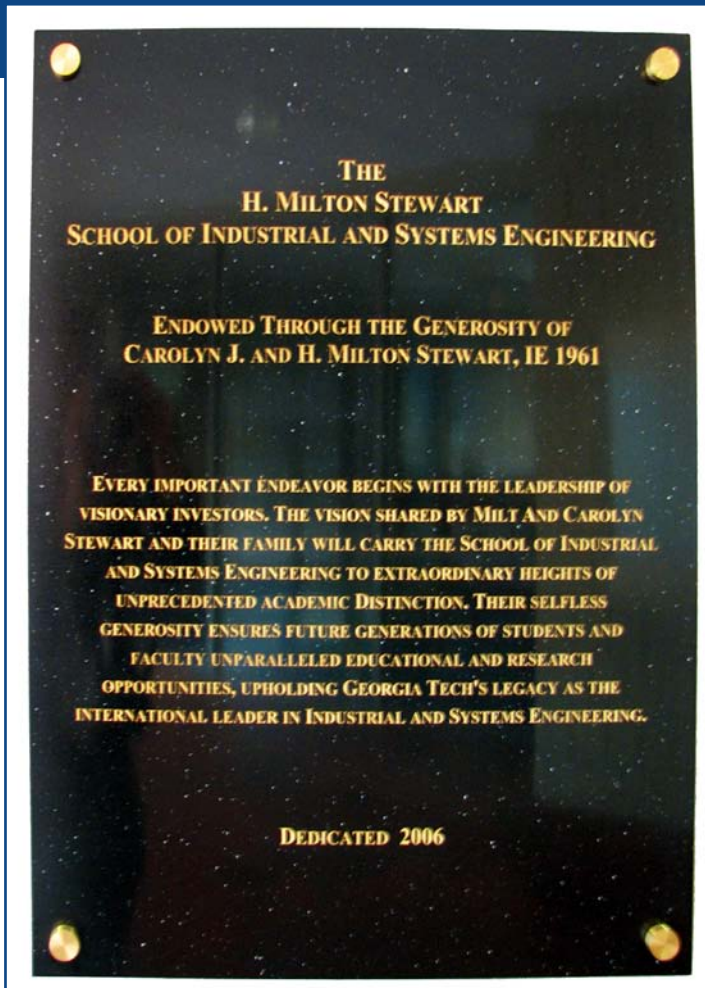
Dedication plaque for the H. Milton Stewart School of Industrial and Systems Engineering.

looked through the catalog and came across IE. I liked the curriculum, so I changed my major and never looked back.

EE: How did your experience at Georgia Tech and in ISyE help you with your career?

MS: The IE curriculum offered statistics courses which I really enjoyed. I even took one as an elective. Statistics was very material to telecommunications in the 20th century in order to optimize electromechanical switching equipment to handle busy-hour call volume. The standard criterion was to design switching offices to achieve at least 97 percent switching success at the very busiest moment of the busiest day of the year.

The curriculum also required a couple of courses in electrical engineering, lots of mechanical engineering, some civil engineering, and other courses outside of IE that were very helpful in surveying, designing, and building telecom transmission lines and switching offices. In IE, I found Plant Design and Layout, Material Handling, and Engineering Economy to be very helpful.

Of course, there were general courses such as math and English that were essential, and I even found that Engineering Drawing gave me a big advantage over non-engineers. I was able to train many others and build one of the best independent telephone engineering departments in the nation. I also tested for and obtained a Professional Engineering license before entering the management arena.

EE: Tell us about your goals and experiences with the Standard Group. What did you learn during your career that you believe is essential for today's students and graduates?

MS: Because Georgia Tech demanded so much of us as students, we demanded much of those with whom we worked. It didn't make us the most popular guys in the office, but we were usually associated with excellence. People who aspired to rise above the crowd did well to attend Tech, and it reflects in the old joke, "What do Georgia grads call Tech grads?" Answer: "Boss."

At Standard Group, it took me more than a few years to mellow. In my early years, I demanded a lot—some would say too much—from my people. But we sure gave our customers their money's worth. My Dad used to say, "People who work for less than they are worth will always have a job." That is what we always tried to do…provide more than we were paid to provide…to give something extra. I still believe a mind-set of giving something extra is crucial to lasting success as well as a feeling of self-fulfillment.

EE: Who were your favorite professors while you were at Tech? Favorite classes? And why?

MS: I loved statistics, which means I enjoyed Lynwood Johnson and Harold Smalley, who taught the statistic classes I attended. I took two classes under Lynwood when he was very young, slender, and red-headed with a flat-top haircut. Many years later, I dropped in on him in his office and told him I was a former student, and that I made the only A in one of his statistics courses. He asked me what course and the year, then went to his file cabinet and retrieved the grade book for that year. He confirmed that I was correct and later wrote me a warm letter. I really appreciated that.

I also enjoyed Cecil Johnson, who taught motion and time study. He made it a real fun course, and we learned a lot. I never took a course under Colonel Groseclose, the founder of the School at Tech, but I worked for him in the IE office while I was student. I loved the Colonel. He was a wonderful person and a great leader. He asked me to continue my studies in the graduate program, but I told him that if I ever got out of Tech, I would never step foot on a college campus again. I soon ate my words.

Perhaps my all time greatest teacher was Ed Vassian, who taught me Freshman Chemistry. After our first quiz, he gave us back our papers. Everyone in the class had failed. Vassian said he was going to interrupt our Chemistry lessons for one week in order to teach us math, because without a real understanding of math we wouldn't stand a chance at Tech.

The Stewart Family at the School Dedication Ceremony on May 12, 2006. (L-R: Glenn Archer, Stephanie Stewart, Carolyn and Milt Stewart, Jill Stewart Archer, Jeb Stewart, and Whitney and Jack Archer)

If it were not for Ed Vassian, it is doubtful that we would be having this conversation. He gave me a greater understanding of math in one week than I had received in four years of high school.

EE: What were the organizations you were involved with while you were a student?

MS: I was a bookworm by necessity, and I didn't do much else. I belonged to the Radio Club for several years, Alpha Phi Omega service fraternity, the Wesley Foundation, the Institute of Industrial Engineers, and Sigma Nu social fraternity, which I really couldn't afford.

EE: What are some of your favorite memories about your time at Georgia Tech?

MS: My freshman year was most memorable. My Dad dropped me off at the corner of North Avenue and the Expressway and told me to call if I needed him. I was on my own to sink or swim at Tech. I went into Smith Dorm and was assigned to Smith 101, a four-man room beneath the stairs at ground level. I had great roommates, and we had some really good times. I sometimes wonder how we stayed in school with the kind of trouble we got into. We played hard, but we worked even harder. Meal time alternated between the Varsity and Junior's. Hamburgers at the Varsity were two for a quarter.

One of our roommates was a fourth-quarter sophomore and a great guy from New York. Dave would stay up several nights each week studying, and he would sleep all weekend. He would buy Camel cigarettes from the machine, and in those days you put a quarter in the machine and received change in pennies that had been inserted into the cellophane on the cigarette pack. Generally, there were one or two cents in each pack and Dave would throw them onto the chest of drawers. By the end of the first quarter, there were so many pennies piled up that they covered the top and spilled to the floor. We laughed when Dave would be in the other room studying at three o'clock in the morning and would wake us up screaming, "I hate this ____ school!" Then we would usually hear the door slam. An hour later, he would come back in and resume studying. That was encouragement for us to study, because we had learned that Tech began weeding operations no later than the sophomore year. I tried staying up several nights with Dave and that was good training for the future.

I remember going through the cafeteria line at a short course at Harvard Business School around 1980 and hearing someone talking at a table about how difficult Georgia Tech was and how it had made him a millionaire by teaching him self-discipline and hard work. I told him I was a Tech graduate and he asked me when I graduated. He said he graduated the same year. Then he told me his name. This old man, it turned out, was a good friend and neighbor in Smith 102 during 1956. We had both changed so much we didn't recognize each other. As if the world wasn't small enough, I ran into him again at Jekyll Island 10 years later. He lives in Venezuela, by the way.

EE: Georgia Tech has become a family tradition in the Stewart family. Have you encouraged this, or did your children find their own way to the Institute?

L-R: Whitney Archer, Carolyn Stewart, and Jack Archer riding in the Ramblin' Wreck outside the Stewart School.

MS: I encouraged my son to attend Tech, but not my daughter. Tech was near a rough neighborhood during those years, and I wanted her to attend a college where we could feel she was secure. However, she said she would not attend any college if she could not attend Tech, so I agreed provided she joined a sorority where she would be able to stay on campus all four years.

Without really knowing it, I had apparently brainwashed my entire family during the early years. Jeb married a civil engineer and Jill married an industrial manager from Georgia Tech, who is third-generation Tech and whose brother graduated from Tech. Jeb is the second most devoted Tech fan I know; the title belongs to my wife, Carolyn.

EE: How did you and Carolyn meet? Is there a Tech connection?

MS: I met Carolyn when I returned to my home town after graduation. I knew her sister, who one day came into the restaurant where I was having lunch and she had a really cute girl with her. I turned on the charm and in three short years we were married. That was 40 years ago. I think I really won her over the day I took her to a Tech football game on our third date.

EE: Are you involved in any professional/work projects these days?

MS: After working for 45 years, my business life is mostly behind me. I entertained the idea of practicing engineering for awhile, but after a brief taste of retired life, I let my license expire. We have a little family enterprise that is a lot of fun and something that I can leave as a legacy to my children and grandchildren.

In addition, I enjoyed trains as a child and will again in my second childhood. We built a narrow gauge railroad on our property in north Georgia and will be operating the J.A.W.J Railroad— named by taking the first initials from our grandchildren's names. Now I will be a sho'nuff engineer. My two trains are being built in Oregon. One engine will be named the Texas, and the other will be named the General. People interested in Confederate history will understand the significance. Our property is very near the scene of the Great Locomotive Chase. The Texas was to be delivered in September 2006. The adult ticket to ride will consist simply of bringing a child to ride on the train.

EE: What are you doing to enjoy your retirement?

MS: We played golf for several years and fished. Now we are more interested in our north Georgia property and what it means to our family and grandchildren. Thanks to Jeb and Jill, we have a good operation underway with timber, farming, hunting, and recreation. The railroad is near a gorgeous 8-acre pond that I named Lake Carolyn. Jeb took ownership of a project to build a 50-acre lake that should be finished by next spring, if not sooner. Jill is leading our effort to host a family picnic—about 60 or 70 relatives—at Lake Carolyn to celebrate a new pavilion and the official opening of the J.A.W.J Railroad. Beyond that, we don't require much else. We are devoted to our family and Georgia Tech. Our plate is full. *e*

(L-R) Raleigh Burgess, John Stigaard, Carole Collins, and Jeb Stewart.

Healthcare is the largest industry in the United States, representing more than $1.5 trillion per year in expenditures, or more than 14 percent of the Gross Domestic Product. The Healthcare Finance Administration (HCFA) has estimated that as much as $300-500 million per year are unnecessarily wasted in what is also the nation's most inefficient industry. Annual healthcare costs continue to rise at more than 10 percent per year, with a looming crisis as the population ages.

SciHealth Offers "IE-Style" Healthcare So

From a clinical perspective, healthcare providers are faced with growing pressure from adverse publicity regarding quality of care, as well as civil litigation, resulting in skyrocketing insurance costs and increasingly competitive market pressures. The National Academy of Sciences has announced that 48,000 to 98,000 people may unnecessarily die in U.S. hospitals each year.

Operationally, the nation's approximately 5,000 hospitals are faced with managing beds and patient flows, staffing challenges, and a myriad of other critical issues in the face of considerable internal and external demands—all while facing new reimbursement models, including capitation, that disaffect current processes.

In this environment, there is a great need for industrial and systems engineers. H. Milton Stewart is not the only Georgia Tech alumni in his family that is grateful to the Stewart School. When his son, Jeb Stewart (Cls. 1991) was a student at Georgia Tech, he came up with a concept that grew into SciHealth, Inc.—one of the leading new innovative companies in healthcare decision support. The company provides "IE-style" software and solutions to hospitals.

"When I was in school at Tech, I remember one of my professors telling me that getting a degree in industrial engineering was kind of like 'getting a technical degree in common sense,'" says the younger Stewart. At that time, Stewart came up with some ideas for what he believed was a more "common sense," usable approach to engineering and statistical software that eventually became the basis for SciHealth.

Fast forward several years later. After Stewart took part in a rapidly growing startup technology company that sold in 1998, he was looking around for another opportunity "to do something meaningful and to work toward another success." That is when the software idea from college came up again. He started to build his concept for the manufacturing industry when John Stigaard (BIE 1991), then director of Management Engineering at an Atlanta hospital, pointed him to healthcare. Says Stewart, "It certainly sounded like a meaningful, large opportunity."

The initial research revealed to Stewart a great need in hospitals for exactly what IEs do. He also found that many of the most respected, leading industrial engineers in healthcare—often called management engineers or "MEs" in hospitals—were from the Health Systems program at Georgia Tech. The program at that time was under the direction of Dr. Justin Myrick in ISyE. Says Stewart, "It seemed like everywhere I went, I found Georgia Tech IEs and many others who believed in and helped in what we were doing."

Stewart expresses gratitude to (now retired) Dr. Myrick, the H. Milton Stewart School of Industrial and System Engineering at Georgia Tech, and its Health Systems program. He notes, "Of course, the Health Systems program has now evolved on a
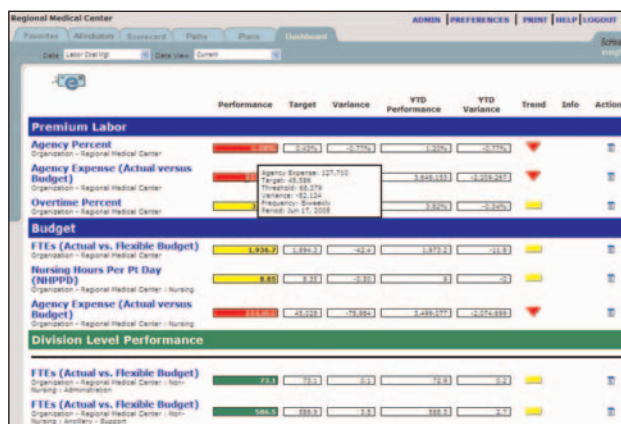
Dashboard view with performance cell in SciHealth software.

Dashboard view with performance meters in SciHealth software.

greater scale into the Health Systems Institute (a multidisciplinary institute located in the College of Engineering) under Dr. Francois Sainfort, who also deserves a great deal of credit. I believe strongly in that initiative and what they want to accomplish, as well as the immense continuing great need for industrial/management engineers in healthcare.

"There is no doubt that you or I—or someone we care a great deal about—will need health care at some point in our lives," he says. "There is also no doubt that the healthcare industry has plenty of need for more 'technical common sense' in order to systemically improve clinical, financial, and operational processes for the greater benefit of all of us."

Stewart shares some of the perspective he has found in serving the industry:

"We know that there are a lot of great, intelligent practitioners in healthcare who are anxious to help others. But, we also see a healthcare system that makes it difficult for these good people to implement meaningful change. We find many forward-thinking organizations that are eager to embrace new clinical technologies. At the same time, we also encounter some people in the industry that are (often understandably) unable or reticent to use information technology to effect change and improve at the pace of other verticals."

With that in mind, Stewart approached some provider organizations to be partners in building the initial software application. At that time, Emory Healthcare was progressively trying to improve processes within its organization. It happened that some of its people were former Georgia Tech ISyE

The SciHealth management team.

Snapshot of end user controlled favorites.

students. "When we approached the management engineers at Emory with our concept, they really 'got it,' and agreed to allow us to build our initial application for them."

Stigaard also believed in the opportunity and the need. He became the first employee and the driving force behind SciHealth. Stigaard and Stewart say that they "conceptually wanted to have an entirely new approach to helping our clients bring together clinical, operational, and financial information to make better informed decisions." To find a broader perspective, they went to some lengths to find other, disparate organizations across the country that would collaborate with them to build a functional, flexible solution.

The pair later brought in Bill Leander to be the president of the company and move it forward. "We had this picture of exactly who we wanted to drive the company with us: someone that had built successful, related companies in the past and had the vision and experience to take SciHealth to a much higher level," Stewart says. "We found Bill, who has been all that and more. Together, Bill and John and others within the company have driven the scope, vision, and innovation far beyond my initial concept."

Since its early stages, SciHealth has grown rapidly. The company has been able to cash flow its regular operations since the end of 2002 and has roughly doubled in sales every year. Sci-Health is now in hundreds of hospitals, and in dozens of the most progressive provider organizations, throughout the country. "Don't get me wrong: we still have a long way to go," Stewart says. "But, it feels great to see our concept working and helping our customers improve performance, reduce costs, and provide better quality of care. We really feel like we are helping them save money and lives."

Stewart is quick to add that others deserve most of the credit: "Our guys are all about functional competence. We owe a lot of our success to substance, innovation, and the merit of what we do for our customers. I wish I could take some credit myself," he adds. "But, I have to give it to John and Bill and so many others—including our clients, who really are our partners. To varying degrees, they all understand and participate in the vision of what we want to become."

"I am a great fan of ISyE School Chair Chip White and College of Engineering Associate Dean Francois Sainfort, and so many others working with them in their programs. I would like to use this article to thank them and all the great Georgia Tech people that have helped us get this far. I won't even try to name all of our friends from the Health Systems and ISyE programs that have aided us along the way. They are too many to fit in this article," he says.

"But, I will take this opportunity to particularly express gratitude to my dad for all that he has taught me and done for me. All my life, my dad has really been there for me. He is a man of great character and integrity. He has taught and challenged me to grow and improve. He has provided me with great opportunity and sense of obligation. I don't really have the right words to thank him."

He continues, "I also want anyone that reads this magazine to know that I really appreciate the efforts of Georgia Tech's ISyE program and Health Systems Institute in the healthcare industry. What they do is essential for all of us. SciHealth has hired a number of Georgia Tech grads over the years. Georgia Tech certainly turns out some of the very best people for what we do." *e*

Health-Related Activities in

the H. Milton Stewart School

By Paul Griffin, Associate Chair for Undergraduate Studies and Professor

According to the Organization for Economic Cooperation and Development (OECD), United States spending per capita on healthcare was $5,635 in 2003. This figure was two-and-a-half times the comparable median for OECD countries and 53 percent more than any other country. In addition, national health expenditures rose from $246 billion in 1980 to more than $1.4 trillion in 2001, according to the National Health Statistics Group. It is estimated that as a country we will spend more than $2 trillion in health expenditures this year, and that the main reason for these increases is simply higher prices, not higher utilization of resources. This means that this increase in spending is not necessarily leading to the provision of additional or higher quality services.
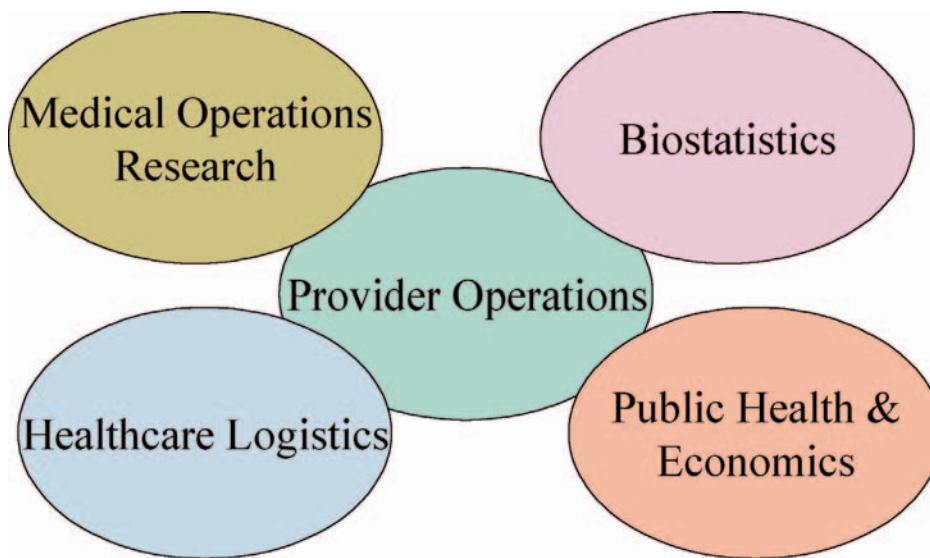
Figure 1. Strategic Health-Related Areas in the H. Milton Stewart School of Industrial and Systems Engineering

School of Industrial and Systems Engineering Since the change, Professor Sainfort started the Health Systems Institute (HSI), which is a College of Engineering center and is a joint program with Emory University. Additional information about HSI may be found at www.hsi. gatech.edu. Several ISyE faculty, such as professors Christos Alexopoulos, David Goldsman, and Eva Lee have been working with HSI in various ways, including the development and delivery of professional education courses.

Throughout the remainder of this article, the focus will be exclusively on activities in the H. Milton Stewart School of Industrial and Systems Engineering of

Rising costs, however, are only part of the problem. The number of uninsured people in the United States has grown to well above 45 million, and the uninsured are more likely to forgo or postpone care. This can in turn lead to an increase in primary care expenses, such as hospitalization for health conditions that could be avoided. A related issue is that by almost any measure, the disparities in health status and receipt in preventative care for the poor, minority, and elderly populations are growing. A further concern is that many people of those covered by safety nets, such as Medicaid, have at best limited access to care. According to the Health Resources and Services Administration, more than one-fifth of the U.S. population lives in areas designated as a Health Professional Shortage Area. More than half of the population in the Southeast lives in Medically Underserved Areas.

It comes as no surprise then, that *health* is an area that many of our students and faculty are passionate in developing ways to improve. Health-related activities, and in particular health systems, has played an important role in the H. Milton Stewart School of Industrial and Systems Engineering for many years now. In this article, we provide a brief snapshot of some of the current activities. We first discuss current research and then some of the educational activities.

Health-Related Research

"Health" is quite a broad field, and across the Georgia Tech campus, various Schools and Colleges are trying to address different components. The initial work the H. Milton Stewart School of Industrial and Systems Engineering of ISyE focused on was health systems provider operations; particularly with regards to hospitals. This started with the work of professors Harold Smalley and Justin Myrick (both retired), and was continued and broadened by Professor François Sainfort. Last year, Professor Sainfort moved his primary appointment to the School of Biomedical Engineering, though he remains affiliated with the H. Milton Stewart

ISyE. Figure 1 shows the five key areas where ISyE faculty are conducting research. Although space limitations do not permit discussion of all of the health-related research taking place in ISyE, examples in some of the different areas are provided below.

Public Health Example: RealOpt. Professor Eva Lee has been working with the Centers for Disease Control and Prevention (CDC) to develop a program that helps healthcare departments efficiently prepare for and respond to infectious illness, whether it's a natural or man-made outbreak. The program is called RealOpt and is being installed at several state government departments of health. The program will also soon be available to any government health department that requests it from Georgia Tech. RealOpt uses large-scale simulation and optimization techniques to perform several tasks including determining the best locations for emergency clinics, most efficient clinic layout, number of healthcare professionals needed, and number of vaccinations needed. RealOpt uses real-time information once emergency treatment occurs in order to reallocate patients and resources; i.e., to dynamically adjust, which is critical for catastrophic events. A figure illustrating the RealOpt system is shown in Figure 2. It is worth mentioning that this research has been featured and discussed in publications such as *The New York Times, London Times,* and *Atlanta Business Chronicle.*

Medical Operations Research Example: Radiotherapy Planning. Cancer is the second major source of death in the United States, affecting more than a million new patients every year. At some stage in their treatment process, over half of all cancer patients, more than 500,000 patients annually in the United States, receive some form of radiation therapy. An important recent advance in this area is Intensity-modulated radiotherapy (IMRT). In IMRT, the cancer patient is treated with many small beams of radiation, each of which can have a different intensity. A crucial planning problem in IMRT is that of selecting a combination of beam geometries, energies, and

intensities to provide the best compromise between delivering effective radiation dose to the cancerous tumor while limiting the radiation dose to adjacent healthy tissue. ISyE faculty professors Shabbir Ahmed and Martin Savelsbergh are collaborating with Dr. Ian Crocker and Dr. Timothy H. Fox from the Emory School of Medicine on developing a fully automated system for robust and efficient IMRT planning. Their approach is based on novel linear programming models and incorporates a multitude of clinical objectives. In preliminary case studies, this new IMRT planning approach has already demonstrated enormous time savings in generating high quality treatment plans over earlier approaches.

Provider Operations Example: Safety. Patient safety is a current and compelling concern in healthcare due to the enormity and pervasiveness of the problem. This problem, first made transparent with the publication of the Institute of Medicine's report, "To Err is Human," is

Figure 2. Diagram of the program RealOPT.

multifaceted and is being attacked by various organizations and researchers with different foci and tools. The thesis of some of the faculty in ISyE is that the injection of various technologies, hard and soft, for combating this problem is considered instructive. Systems technologies, including information processing modules and human systems anchored tools, are being embraced. One of our earliest studies, funded by AHRQ through the Georgia Hospital Association, focused on medical errors in hospitals. The Georgia Tech component investigated the use of systems engineering and related technologies to minimize medical and medication errors in hospitals. Building on this experience, Professor Esogbue has embarked on a series of different but related studies exploiting industrial engineering and human factors technologies to address a broader class of patient safety issues. Examples include the efficient use of root cause analysis methodology in identifying causes of errors in hospitals, proper use of barcoding and other sensing technologies, equipment maintenance problems and their impact on medical errors, facility layout and material handling issues as they relate to medical errors, and techniques to improve the timeliness of laboratory testing procedures and results. Some of these studies have examined operational efficiencies of emergency rooms with respect to minimizing the possibility of medial errors in

intensive care units. His recent studies have focused attention on the use of proven space technology spin offs with impressive impacts on the problem.

Provider Operations Example: Simulation Modeling. Professors Christos Alexopoulos and Dave Goldsman have conducted a variety of studies related to healthcare systems, ranging from patient flow simulation models to decision support systems for medications. In particular, in collaboration with the Partnership for Immunization Programs at the University of California, San Diego, they developed user-friendly simulation models that allowed health clinics to increase immunization rates for children by improving their scheduling techniques and patient flows. Similar models were developed with the Centers for Disease Control and Prevention (CDC) to analyze patient flow in a large women's hospital in Kabul, Afghanistan. Another line of research, again in conjunction with the CDC, analyzed the cost-effectiveness of a school-based Hepatitis B vaccination program in Denver, Colorado. In addition, Alexopoulos and Goldsman have participated in medical studies related to the efficacy of cardiovascular medications for Merck & Co. More recent work, in conjunction with Carter Center personnel, has included modeling the propagation of Guinea worm disease in The Sudan.
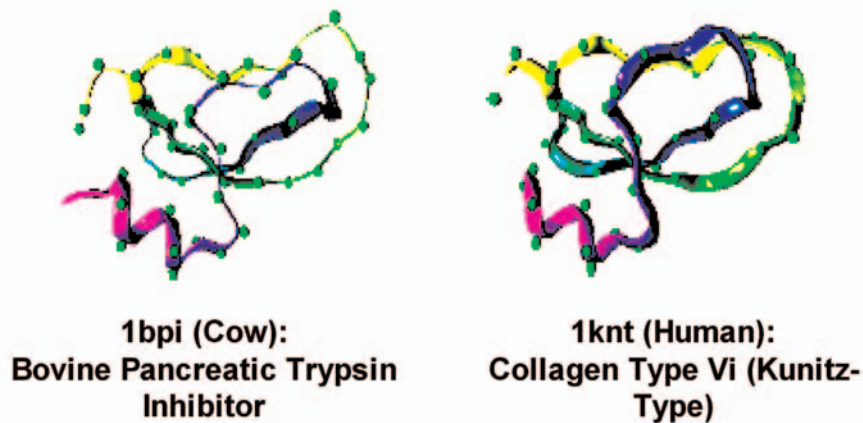
Figure 3. Protein folding example.

Medical Operations Research Example: Protein Folding. When proteins are created, they quickly fold themselves into compact three-dimensional structures. Proteins with strong physical similarities in their tertiary (folded) structure often have similar functions, so understanding physical similarity could be a key to developing protein-based medical treatments. The question "are these two shapes similar (and if so, how similar are they)" is known as the *protein structure alignment problem* (see Figure 3 for an example). However, asking the question without a mathematical definition of similarity and a measure of the degree of similarity leads to very subjective answers. The maximum contact map overlap (CMO) model of protein structure alignment provides a quantitative way of measuring similarity in protein structures. Professors Joel Sokol and Earl Barnes have shown that solving the CMO problem reduces to solving a well-known graph theory problem called the maximum clique problem. They have proved some special mathematical properties of CMO *maximum clique problems*, and shown how to use them to solve the problems much more quickly. In related work, professors Sokol and Craig Tovey and PhD student Justin Melvin are developing specialized data structures that require much less memory and allow our algorithms to run significantly faster than the original did, so that we can now solve larger CMO problems. Currently, they are working to generalize this model to answer related protein structure questions posed to us by Professor Jeffrey Skolnick, the newly hired director for the Study of Systems Biology.

Data Mining Example: Detecting Health Insurance Fraud. Examples of health insurance fraud include employee adding ineligible members to a family insurance plan or a patient or doctor reporting untruthful operations. Fraud costs companies, insurance organizations, and government agencies billions of dollars each year. Some ISyE faculty are developing a machine learning tool that collects relevant data from several sources and applying data mining techniques to suggest cases for follow-up audit studies. The challenge in mining fraud data is the imbalance of size of the populations for regular and fraud cases. A smaller percentage of fraud cases make statistical learning difficult. Moreover, there are potential positive-negative and negative-positive error-like cases hidden in the learning samples. For example, persons committing fraud can find ways to disguise their profiles such that they do not stand out in regular pattern analysis. These faculty are making progress to deal with the many challenges involved. Similar tools apply to other areas such as bank fraud and money laundering.

Biostatistics Example: Gene Expression. Development of long-term CD8 T cell memory is an important goal of vaccination because it can provide protection against reinfection and disease. To better understand how memory T cells form during an immune response, a time course of gene expression and functional changes in antigen-specific T cell during viral infection was evaluated by Dr. Ming Yuan and the Emory Vaccine Center. A critical component of this research is the development of statistical methods that can identify key players among thousands of genes in the presence of many sources of variation that affect the measurements. Merging advanced stochastic modeling techniques and tools from statistical computing, we develop an efficient method to find the needles in a haystack—genes that play a central role in the process.

Health Logistics Example: Delivery Strategies for Blood Products Supplies. Blood products have a short lifespan and therefore their supply and inventory has to be managed carefully. As a consequence, blood products are delivered to hospitals on a regular basis in order to ensure that an adequate supply of the required blood products are available. However, the inventory levels have to be carefully controlled to avoid the spoilage of blood products. Thus the blood bank is faced with a situation in which a set of customers (hospitals, clinics, medical institutes), requires regular deliveries of certain products (blood conserves) which they consume at different rates. Any delivery policy should be such that no shortfalls of products occur at the customer, but at the same time spoilage of products has to be kept at a minimum. Professor Savelsbergh has been working with colleagues from the University of Vienna and the Austrian Red Cross to improve their current system of delivery. They have developed a more flexible and dynamic routing system to reduce the delivery costs and investigated the benefits of changing from a vendee managed inventory set up to a vendor managed inventory system. Three solution

approaches differing in terms of underlying philosophy, development time, and performance were developed. An extensive computational study analyzing various aspects of the three solution approaches was conducted. The results of the computational study are encouraging and indicate that switching to a vendor managed inventory environment may significantly reduce delivery cost without affecting reliability.

Health Economics Example: Community Health Centers (CHCs). CHCs provide family-oriented healthcare services for people living in rural and urban medically underserved communities; they are an important part of the government's plan to make healthcare more affordable. Professors Julie Swann and Paul Griffin have developed an optimization model to determine the best location and number of new CHCs in a geographical network, as well as what specific services each CHC should offer at which level. They have also developed statistical methods on national health databases to determine important predictors of healthcare need, and we apply these methods to Census data to obtain community-based estimates of demand. Part of the usefulness of this model is that they can now look at whether increasing access through additional CHC locations and services or increasing insurance coverage (such as lowering Medicaid qualification levels) have a bigger impact in health provision.

Other research projects currently underway by various faculty and students include:

- Sensitivity analysis for viral dynamics studies
- Influenza modeling
- Novel pattern recognition and classification algorithms for early disease diagnosis and prediction, target therapeutic intervention, and disease monitoring
- Analysis of clinical treatment modalities and design of individualized (patient-centered) optimal treatment regimens for cancer
- Clinical outcome analysis and development of prediction rules for treatment effectiveness
- Cost effectiveness of HIV and HepC screening
- Quality control of healthcare systems
- HIV transmission modeling
- Hospital revenue and capacity management

In addition to faculty research, there are two ISyE centers which focus on health-related research:

The Center for Operations Research in Medicine and Healthcare founded in 1998, is a collaborative education and research center established between the H. Milton Stewart School of Industrial and System Engineering and medical and healthcare researchers in different disciplines. The mission is to foster interdisciplinary education and research efforts involving the advancement and application of sophisticated mathematical and computational techniques from the field of operations research to problems in medicine and healthcare. Key faculty for this center are professors Ellis Johnson, Eva Lee, and Joe Wu. The Center is also part of HSI.

The Health Logistics Research Center started in 2006 as part of The Logistics Institute. The Center is involved in research for suppliers and providers of health-related goods and services with the goal of more efficient and effective healthcare delivery. Specific areas of research include location modeling, routing and inventory positioning, capacity management, and hospital operations. The Center is interested in issues that impact both the private and public sectors. The directors of this center are professors Griffin and Savelsbergh.

Health-Related Education

In addition to its research activities, the H. Milton Stewart School of Industrial and System Engineering continues to offer educational opportunities in health-related areas.

For more than 30 years, ISyE has offered a Master's Degree in Health Systems. The focus of this degree is to develop, apply, and disseminate new knowledge with respect to the analysis, planning, implementation, demonstration, and evaluation of operational and managerial systems for the delivery of healthcare services to the public. This is the only master's degree in the H. Milton Stewart School of Industrial and System Engineering that provides significant levels of funding for its students. Professor Sainfort has been coordinating the degree since his arrival at Georgia Tech, taking over this responsibility from Dr. Myrick. In an effort to broaden the appeal of this degree and to involve other Georgia Tech colleges and schools, there are discussions underway for making this a joint degree with other programs.

The H. Milton Stewart School of Industrial and System Engineering has PhD concentration areas in Optimization, Stochastic Systems, Manufacturing/Logistics, Economic Decision Analysis, Applied Statistics, Human Integrated Systems, Algorithms-Combinatorics-&-Optimzation, and Bioinformatics. There is currently an effort underway to develop a new concentration in Medical Operations Research and Biostatistics. Part of the motivation for this effort is faculty strengths (particularly with the recent growth of the statistics faculty), the uniqueness of the program, and potential ties to other Georgia Tech programs such as HSI and Computational Biology.

There have also been several new courses developed. For example, at the graduate level there are new courses in Cancer Biology & Biotechnology, Biostatistics, and Healthcare Logistics. At the undergraduate level, there is a new course in Medical Operations Research.

Conclusions

The bottom line is that health-related activities remain an important and growing area in the H. Milton Stewart School of Industrial and System Engineering. You should expect to hear a fair amount about these activities in future issues of *Engineering Enterprise.* *e*

Now Accepting Applications:
Go Global with EMIL

By John Vande Vate, EMIL Executive Director and Professor of Industrial and Systems Engineering

The Executive Master's in International Logistics' (EMIL) program will graduate its fourth class in December, 2006. Faculty and staff won't have much time to relax, as a new group of students is expected in January, 2006. There is still room available in the next class, and prospective students may apply on the EMIL website (www.emil.gatech.edu) through November 15.

EMIL participants are professionals with demonstrated career success, a clear potential for leadership and a desire to fully participate in an intense educational opportunity. The Class of 2006 totals 29 students, says Executive Director John Vande Vate. More than 20 percent of these students are at the vice president or higher level; another 20 percent are directors; and the remainder are all senior managers. They work for companies such as Intel, Dell, Hewlett-Packard, UPS, BMW, and Maersk; and they hail from around the world, including Shanghai, Copenhagen, Florence, Costa Rica, Panama, and the United States. They are clearly an impressive group.

During the 18-month program, students attend five intense two-week residences and participate in distance learning coursework. Two of these residences take place in Atlanta, and the remaining international residences are held in Asia, Europe, and Latin America.

While many academic programs offer case studies, EMIL students participate in what Vande Vate calls "live cases."

"The faculty will meet with a company several weeks before the class goes to the site and identify issues of current interest at the company," he says. "Then

we put together some collateral material to help frame the issues for the class. When we get to the site, the whole class meets with the decision makers to discuss the issues."

Members of the Class of 2006 have a world of memories to go with their diplomas. Here are just some of the companies and organizations they met with during their busy international residences:

European Residence:

(Belgium, France, Germany)
- European Commission
- Toshiba Tec
- Renault CKD
- Westunderland
- Port of Le Havre
- Cedilec
- Bosch
- Hewlett-Packard
- CoLogic
- BMW

Asian Residence:

(Japan, Hong Kong, Shanghai)
- YKK
- Wal-Mart Global Procurement
- UPS
- Motorola

- Hongku District Officials
- Shanghai Municipal Economic Commission
- NEC Corporation
- Carrefour
- Shanghai GM
- The Walt Disney Company
- BAX Global Logistics
- Lenovo

Latin America Residence:

(Panama, Brazil)
- Latin American Logistics Center
- Hapag-Lloyd Container Lines
- Kuehne + Nagel Lead Logistics
- Panama Ministry of Commerce
- DHL
- Pfizer
- Ace International Hardware Corporation
- Panama Canal Commission
- Manaus Free Trade Zone Administration
- Nokia
- Honda
- The Coca-Cola Company
- Gradiente Philco
- Unilever
- Chep *e*

Images courtesy of JupiterImages Corporation

Georgia Tech's Industrial Engineering Program Remains Number One

The H. Milton Stewart School of Industrial and Systems Engineering at Georgia Tech continues its reign as the No. 1 graduate program in industrial engineering, according to *U.S. News & World Report*'s 2007 rankings. This is the 16th year in a row that ISyE has held this title.

Chelsea White III, the H. Milton Stewart School of Industrial and System Engineering Chair, is pleased to see the School continue the tradition it began under former chairs Mike Thomas and John Jarvis. "We can take pride in the fact that our hard work and dedication to excellence in education and research continue to be recognized," he said.

"We should not alter what we do for the sole purpose of trying to improve our rankings. But rather, if we carefully choose the areas in which we want to excel and deliberately work towards achieving our objectives, then the rankings will follow. Let's use this achievement as a time to rededicate ourselves to making our College and the H. Milton Stewart School of Industrial and System Engineering an even more exciting, productive, and enjoyable place to be."

Overall, the College of Engineering ranked sixth, down one from 2005. Three additional schools within the College of Engineering ranked among the top five in their respective disciplines. These are: aerospace (2nd), biomedical (4th), and civil (3rd). *e*

ISyE Welcomes New Director of Development

Nancy J. Sandlin, Mgt. 1992, joined the Stewart School earlier this year as director of development. She has worked at Georgia Tech for seven years, most recently as associate director of development in the School of Electrical and Computer Engineering. She has also served the College of Computing as a development associate and an external affairs associate. In this new position, she will work with School Chair Chip White and the Central Development Office to reach a $50 million School goal as part of Campaign 2010, Georgia Tech's $1 billion capital campaign.

In addition to her bachelor's degree, Sandlin holds Georgia Tech certificates in Marketing and Organizational Psychology. She is a former vice president of Techmasters, the Georgia Tech chapter of Toastmaster's International.

Sandlin welcomes the opportunity to interact with ISyE faculty and alumni. "It is very exciting to lead the development effort for the No. 1 industrial systems program in the United States—or better yet, in the world," says Sandlin. "With more than 11,800 first-rate alumni, and an extremely talented faculty, the Stewart School has leaders in almost every field. Our students, faculty, alumni, and friends have consistently proven to be extraordinary people, and I am proud to work alongside such amazing people. We are dedicated to securing the resources needed to ensure that the Stewart School continues to build momentum as a leader in world-class education and research in industrial and systems engineering."

Sandlin says she is honored to join the H. Milton Stewart School of Industrial and System Engineering at this time. "The generosity that benefactors Milt and Carolyn Stewart have demonstrated in naming the Stewart School, coupled with the strong leadership of Chip White and his faculty, have set the stage to redefine what it means to be the best in the world—and to make a significantly positive impact on its future."

To learn more about the H. Milton Stewart School of Industrial and System Engineering development program, please contact Nancy Sandlin at 404-385-7458 or nsandlin@isye.gatech.edu. *e*

Stewart School Chair Chelsea White Honored with IEEE Society's Joseph G. Wohl Award

Stewart School Chair Chelsea C. White III has received the highest honor from the Systems, Man, and Cybernetics (SMC) Society of the Institute of Electrical and Electronic Engineers, the Joseph G. Wohl Award. Dr. White holds the H. Milton and Carolyn J. Stewart School Chair and the Schneider National Chair in Transportation. He is also former executive director of The Logistics Institute.

The Joseph G. Wohl Award is the Society's highest award, given for career service to the systems community, the IEEE, and/or the SMC Society. The award is not given annually; it is only presented when there is a uniquely qualified nominee, says Pierre Borne, Society Awards Chair and Professor "de classe exceptionnelle" at the Ecole Centrale de Lille, France.

"These awards are attributed after a call for nominations by a committee," says Borne. "This year (2005) seven persons were nominated for the Award, and Chip White was chosen with a strong majority," he added.

White was honored at the Society's International Conference held in Hawaii in October 2005. In the past, he has received the Society's prestigious Norbert Wiener Award, given for technical contributions in the areas of Systems, Humans, and/or Cybernetics.

Former ISyE chair William Rouse, now executive director of Georgia Tech's Tennenbaum Institute for Enterprise Transformation, is also recipient of both awards.

"I am delighted to receive the Wohl award and deeply appreciate having the opportunity to contribute to the IEEE Systems, Man, and Cybernetics Society throughout my professional career," says White. "The Society has had significant impact on the Systems Engineering profession, and I am proud to be part of this. Having known Joe Wohl, an outstanding systems engineering leader and good friend, the award is particularly meaningful to me." *e*

NEW FACULTY

Yajun Mei joined the H. Milton Stewart School of Industrial and System Engineering as an assistant professor Spring Semester, 2006. He received a B.S. in Mathematics from Peking University in P.R. China, and a Ph.D. in Mathematics with a minor in Electrical Engineering from the California Institute of Technology. Mei worked as a post doctoral student in biostatistics for two years in the Fred Hutchinson Cancer Research Center in Seattle, Washington. Mei's research interests include change-point problems and sequential analysis in mathematical statistics; sensor networks and information theory in engineering; and longitudinal data analysis, random effects models, and clinical trials in biostatistics.

Associate Professor **Bert Zwart** joined the Stewart School faculty Fall Semester as the Coca-Cola Junior Professor. Zwart received his M.A. degree in Econometrics at the Vrije Universiteit, Amsterdam, The Netherlands, in 1997. He carried out his Ph.D. research at Eindhoven University of Technology and the Center for Mathematics and Computer Science. His Ph.D. thesis "Queueing Systems with Heavy Tails," received the Applied Probability Trust award (2001), the ASML prize for best Ph.D. thesis in Eindhoven (2002), and the Gijs de Leve prize for best Ph.D. thesis in operations research (in The Netherlands, from 2000-2002).

Before coming to Georgia Tech, Zwart held a postdoctoral fellowship at INRIA, in Rocquencourt, France, and served on the faculty of the Math and Computer Science Department of Eindhoven University of Technology as a VENI fellow and assistant professor. Zwart serves on the editorial boards of several international journals.

FACULTY NEWS

Associate Professor **Shijie Deng** has been elevated to the grade of Senior Member of IEEE.

Professor **Augustine Esogbue** has been honored with the NASA Public Service Medal.

Professor **David Goldsman** was awarded a Fulbright Scholar Grant to conduct research and lecture abroad for the 2005-2006 school year. Goldsman lectured on computer simulation at Bogazici University in Bebek-Istanbul, Turkey. He was also excited to learn Turkish, as his wife and children were already fluent speakers.

Professor **Paul Griffin** had an article chosen to be included in the *Collection of 30 Influential Articles Published in EJOR Celebrating the 30th Anniversary of Euro*. That's the *European Journal of Operational Research*. Griffin's article, "Coordinated Supply Chain Management," was co-authored with D. J. Thomas and originally appeared in the *Journal* in 1996.

Associate Professor **Paul Kvam** has been selected as a Fellow of the American Statistical Association.

Assistant Professor **Nicoleta Servan** was accepted as a participant in the 2006 Young Researcher Roundtable, held as part of the INFORMS conference on practice in Miami in spring 2006. The goal of the Roundtable is to provide young faculty with new perspectives into critical business problems facing organizations today.

STAFF

ISyE Academic Advisor **Patti Parker** received the campus-wide Outstanding Undergraduate Academic Advisor Performance Award at the Annual Faculty/Staff luncheon in spring 2006.

Nadya Ramel, BIE 2003 and other members of Team **Buzzz** joined thousands of other dedicated women and men at the Atlanta Breast Cancer 3-Day Walk in October, 2006. Participants walked 60 miles over three days to raise funds for the Susan G. Komen Breast Cancer Foundation and the National Philanthropic Trust Breast Cancer Fund.

STUDENTS

Ph.D.. student **Claudia Antonini** was awarded second place in the 2006 IIE Pritsker Dissertation Award competition, which recognizes outstanding doctoral dissertation research in industrial engineering. Her thesis title is "Folded Variance Estimators for Stationary Time Series."

Ph.D. student **Daniel Mello Faissol** has received the NASA Harriet G. Jenkins Fellowship. The Jenkins program selects 20 underrepresented students nationally each year to encourage the pursuit of science, technology, and education in NASA-related disciplines.

Ph.D. student **Wuqin Lin** has received a Sigma Xi Best PhD Thesis Award.

Ph.D. student **Evren Ozkaya** has been awarded the John L. Imhoff Scholarship for his excellence in academic and professional achievement and dedication to the industrial engineering profession by the Institute of Industrial Engineers. Ozkaya, the first recipient of this distinguished scholarship, is a native of Turkey. He has worked on cost reduction, supply chain management, logistics, and RFID programs in the U.S., Europe, and Asia.

Ph.D. students **Ozgun Caliskan Demirag** and **Divya Mangotra** were awarded the General Motors Manufacturing Scholarship, which is given to encourage top graduate students to pursue professional careers in manufacturing, recognize their academic efforts, and help defray their cost of study. GM Manufacturing Scholars receive stipends of $750 a month for 12 months.

Congratulations to the Fall 2005 and Spring 2006 winners of the **Best Senior Design Project** award:

Fall 2005 – AirTran. Students **LokHang Chan, Janice Choi, Chuck Hyuksoo Kahng, Andy Nygren, Blake Schnorf**, and **Esmeralda Shkoza. Joel Sokol**, advisor. The title of the project was "AirTran Maintenance Schedule

Optimization System." Professor **Paul Griffin** says, "I should mention that I think this was probably the best project to ever come out of our department."

Spring 2006 – Newell Rubbermaid. Students **Stephanie Carey, Anne Costello, Danielle Pallo, Alex Parker, Mandy Sutton**, and **Blake West**. **Ozlem Ergum,** advisor. The title of the project was "Realignment of Supply Chain Logistics."

Alumni

William H. All III, BIE 1956, of Kennesaw, has retired from Panduit Corporation. He is now teaching part-time at Southern Polytechnic State University in Marietta and teaching and appraising residential real estate for The Benchmark Group.

Colonel Douglas L. Bentley Jr., MSOR 1994, has been named chief of the Command and Installation Division in Program, Evaluation, and Analysis Directorate for the Army G8. His duties include programming all installation and infrastructure for the Army, with programming defined as budgeting for the future. Or to make it simpler, Col. Bentley says he is a Division Chief on the Army Staff in the Pentagon working all Command and Installation issues for the Army.

Ben Dyer, BIE 1970, has received the Joseph Mayo Pettit Alumni Distinguished Service Award from the Georgia Tech Alumni Association. The prestigious award is only given to extraordinary Georgia Tech leaders. Dyer is the president of Jackson Capital, an investment banking partnership affiliated with Jackson Securities. He also is the president of Innovations Publishing and a general partner of Cordova Intellimedia Ventures. He is a member of the Georgia Technology Hall of Fame, the College of Engineering Academy of Distinguished Engineering Alumni, and the ISyE Hall of Fame.

Colonel G. Fred Milburn, BIE 1979, has received the Legion of Merit for service during Operation Iraqi Freedom. In addition, he has been awarded the Defense Superior Service medal for his service in Joint Forces command as the senior operational planner. He has been appointed Chief of Staff of I Marine Expeditionary Force and is currently stationed in Fallujah, Iraq. His wife, Kathy, and their youngest son, Matt, are living in Carlsbad, California. His oldest son, Andrew, is a senior at Georgia Tech, majoring in material science. His daughter Ashley is also a Marine and stationed at Camp Pendleton.

Francisco J. Preston, BIE 1979, celebrated 20 years of marriage in May, 2006. His wife, Norma Zaccara, is from Venezuela. They have two children, Francisco Javier and Michelle Marie, and live in Southern California.

Preston has worked at EcoLab, Inc. since 1987.

Anthony Martin "Marty" Thomas, BIE 1988, MSIE 1992, received his Ph.D. in instructional technology from the University of Georgia in May, 2006. Thomas is now an assistant professor in the Department of Mathematics and Science at Brenau University in Gainesville, Georgia. His current research focuses on how technology can be used to encourage an interest of math and science in women.

Deaths

John Nattress, MSIE 1950, died in November, 2005, at age 85. Nattress was a long-time member of the industrial engineering faculty at the University of Florida, where he had also served as associate dean of that college and as executive vice president of the University. *e*

Please take a minute to complete this form,
and mail or fax it to the school.
Please send to:

Engineering Enterprise
The H. Milton Stewart School of Industrial and
Systems Engineering
Georgia Institute of Technology
765 Ferst Drive, Atlanta, GA 30332-0205
or fax to 404.894.2301

What has been happening with you? Job change? Any recognition you wish to share with your classmates?

Name _____

Degree/Year_____

Home Address _____

City _____ State _____ Zip _____

Home Phone (____) _____

Title/Company Name _____

Business Address _____

City _____State _____ Zip _____

Business Phone (____) _____

E-mail Address _____

Your news _____

_____

_____

_____

_____

Other IE topics you would like to read about in *Engineering Enterprise* _____

_____

_____

_____