



# Engineering **ENTERPRISE**

THE ALUMNI MAGAZINE FOR ISyE AT GEORGIA INSTITUTE OF TECHNOLOGY

SUMMER 2007

## **GLOBAL RED ALERT**

**Humanitarian  
Relief Logistics  
Research at  
the Stewart  
School of ISyE**

**Georgia  
Tech**



**College of  
Engineering**

H. Milton Stewart School of  
Industrial & Systems Engineering

## New Directions in Research and Education



Chelsea C. White III

Welcome to the summer issue of *Engineering Enterprise*. I am particularly pleased that our feature article is devoted to the Stewart School of ISyE students, alumni, and faculty who are participating in several humanitarian relief educational and research activities. This exciting new and potentially high impact area of research and education—and eventually training and outreach—is organized through the Center of Focused Research on Humanitarian Relief Logistics and is co-directed by three Stewart School of ISyE professors, Ozlem Ergun, Pinar Keskinocak, and Julie Swann. The Center operates under the umbrella of the Stewart School's Supply Chain & Logistics (SCL) Institute with support from the Executive Masters in International Logistics (EMIL). EMIL's involvement in this area of activity is also described in this issue of the *Engineering Enterprise*.

The Center is our response to an increase in major natural disasters and the humanitarian and economic need to plan for and respond to such catastrophic events. Tsunamis, earthquakes, and hurricanes come to mind of catastrophes that have recently taken terrible tolls in lives, health, and economic well being in such diverse places as Java, South Asia, Pakistan, and New Orleans. I think you will find this area of activity as compelling as I do, and I will look forward to your comments and feedback.

Humanitarian relief logistics is a key direction that the Stewart School of ISyE is taking toward our broader School goal of having impact beyond the academic community on key issues of societal and economic relevance. Other directions that we are taking in this regard and will report on in the future include energy, the environment, and sustainability; medical operations research and biostatistics; and security. This goal is in addition to our long-term and unwavering goal of being without question the best academic unit in our academic community in the world.

I mentioned the Supply Chain & Logistics Institute earlier, which is the new name of The Logistics Institute (TLI) that many of you have become familiar with over the years. In this issue, Don Ratliff, the executive director of SCL, describes the substance behind the new name and how its organizational structure has changed in order to adapt to and anticipate the rapidly changing and exciting world of global freight transportation, logistics, and supply chain management and design.

This issue is filled with the descriptions of other Stewart School of ISyE student, faculty, and alumni activities and awards. In particular, Eva Lee, one of our associate professors, in conjunction with Memorial Sloan-Kettering Cancer Center researchers, recently won the prestigious 2007 Franz Edelman Award for research entitled "Operations Research Advances Cancer Therapeutics." We anticipate that Eva's research will represent a significant step forward in extending access to quality healthcare for more Americans.

In his article, Professor Paul Griffin, who very ably serves the Stewart School of ISyE as associate chair of Undergraduate Studies, describes new academic tracks in our undergraduate curriculum that represent a substantial increase in the curriculum's flexibility. These new tracks allow our students to expand their breadth of knowledge in industrial engineering without adding additional semesters to their undergraduate degree and, we think, substantially strengthens an already very strong undergraduate academic program.

Let me end my column by welcoming our new Director of Communications, Barbara Christopher. We are delighted to have Barbara with us, leading us forward in communications for the School. Welcome aboard, Barbara.

A handwritten signature in black ink that reads "Chelsea C. White III". The signature is written in a cursive style.

School Chair,  
H. Milton Stewart School of Industrial and  
Systems Engineering



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## Cover Story

Cover Photo: Julie Swann (left), Pinar Keskinocak, and Ozlem Ergun (seated).



# Global Red Alert

*Few can forget the images broadcasted around the world of damage caused after Hurricane Katrina hit the Gulf Coast and by the tsunami in South Asia. With the increasing occurrence of natural and man-made disasters that leave massive devastation in their wake, quicker response and improved coordinated humanitarian relief efforts are needed to get populations in crisis the aid that they need. A recently established Center for Humanitarian Relief Logistics at the Stewart School of ISyE seeks to develop advanced response methods and technologies that will have a global impact.*

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Engineering Enterprise is published biannually by the H. Milton Stewart School of Industrial and Systems Engineering at the Georgia Institute of Technology.

Vol. 1, No. 1  
Summer 2007

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Institute Communications and Public Affairs  
B08C3001  
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## Stewart School of ISyE Receives Thumbs Up

### Stewart School of ISyE Takes Top Billing Again in U.S. News & World Report

The H. Milton Stewart School of Industrial and Systems Engineering at Georgia Tech took top billing once again as having the number one graduate program in the category of industrial/manufacturing engineering, according to

programs within Georgia Tech's College of Engineering ranked among the top ten in their respective disciplines. The Stewart School of ISyE was ranked number one for the seventeenth straight year.

School Chair Chelsea C. White III is pleased to see the school regularly receive this prestigious

*U.S. News & World Report's* 2007-2008 graduate rankings.

This year nine of the eleven

ranking. "ISyE continues to excel in the *U.S. News & World Report* rankings, reflecting a lot of hard work on the part of the faculty and staff this year and in years past.

I take pride in the fact that our efforts and dedication to excellence in education and research are being recognized," says White.

Tech's graduate engineering curriculum maintained its national stature, ranking fourth in the nation by *U.S. News & World Report*. The nine engineering programs ranked in the top ten are: aerospace (5th), biomedical (2nd), civil (4th), computer (6th), electrical (7th), environmental (6th), industrial and systems (1st), materials (9th), and mechanical (7th).

*U.S. News & World Report* published the 2008 rankings last April in a special edition *America's Best Graduate Schools* guidebook.

The H. Milton Stewart School of Industrial and Systems Engineering has successfully completed an Academic Program Review (APR.) Every five years, the Stewart School of ISyE participates in an APR that affords the opportunity to assess the quality of the academic degree programs while determining ways to improve the quality of education, research, and service.

"The Stewart School of ISyE has a rich tradition of ongoing institutional improvement," says School Chair Chelsea C. White III. "Participating in an academic review process is just one of several strategies we use as a vehicle for continuing to improve what we do."

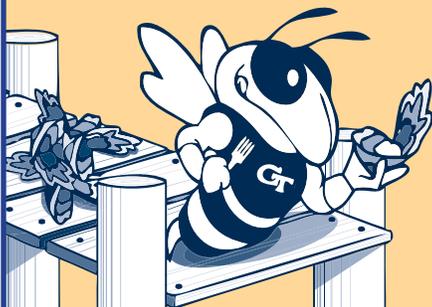
The committee's report, received on March 18, 2007, reconfirmed that the Stewart School of ISyE continues to be the preeminent industrial engineering program in the U.S. and the world. The committee's report also stated that the School is using its funds effectively to educate and train students at all levels, to develop strong research programs, and to foster active relationships with industry and government agencies worldwide.

"The committee's findings are a reflection on the quality of our students, faculty, and staff and help the Stewart School of ISyE to maintain its reputation as producing top-notch graduates, offering an extremely innovative curriculum, and generating exceptional research," says White.

The program review committee was comprised of faculty from peer programs and institutions around the country. The committee included: (Chair) Louis Martin-Vega, Dean of Engineering, North Carolina State University; Susan L. Albin, Professor and Director of the Graduate Program, Department of Industrial and Systems Engineering, Rutgers University; Francisco Barahona, Research Staff Member, IBM Watson Research Center; William Meeker, Professor of Statistics and Distinguished Professor of Liberal Arts, Department of Statistics, Iowa State University; and Yossi Sheffi, Professor, Civil and Environmental Engineering and Engineering Systems, and Director, MIT Center for Transportation & Logistics, Massachusetts Institute of Technology.

## 2007 Oyster Roast

The H. Milton Stewart School of Industrial and Systems Engineering and its Advisory Board cordially invite alumni and faculty to attend the legendary Oyster Roast. Join us for **music, food, drinks, and fun** as the Stewart School of ISyE kicks off '07 Homecoming festivities.



**Date:** Thursday, October 18

**Time:** 7:00 – 9:00 p.m.

**Venue:** The Trolley Barn in Inman Park  
963 Edgewood Ave. NE  
Atlanta, GA 30307

To RSVP: Visit [www.isye.gatech.edu/oyster](http://www.isye.gatech.edu/oyster) or call Ruth Gregory at 404.385.2627 before **October 4.**

## PROSTATE CANCER FACTS:

The American Cancer Society estimates that one in six men will get prostate cancer during his lifetime. More than 218,000 men in the United States will be diagnosed with prostate cancer this year.

# Associate Professor Wins Prestigious Research Award for New Prostate Cancer Treatment

**Eva Lee**, associate professor in the H. Milton Stewart School of Industrial and Systems Engineering, in conjunction with Memorial Sloan-Kettering Cancer Center (MSKCC), won the prestigious 2007 Franz



From left: Stephen Strauss, AT&T Labs; Eva Lee, Stewart School of ISyE; Doug Samuelson, Homeland Security Institute; and Marco Zaider, Memorial Sloan-Kettering Cancer Center

Edelman Award for work entitled "Operations Research Advances Cancer Therapeutics." The award was announced at the annual INFORMS (Institute for Operations Research and the Management Sciences) conference on Operations Research Practice in Vancouver on April 30, 2007.

"Eva Lee, in conjunction with Memorial Sloan-Kettering Cancer Center, has made an extraordinary difference in the health and well-being of cancer patients," says School Chair Chelsea C. White III. "I couldn't be more proud of the work they are doing to help extend access to quality healthcare for more Americans."

Working with Marco Zaider, head of Brachytherapy Physics at MSKCC, Lee devised sophisticated optimization modeling and computational techniques to implement an intraoperative 3-D treatment planning system for brachytherapy (the placement of radioactive "seeds" inside a tumor) that offers a safer and more reliable treatment

of cancer.

Lee's optimization models and algorithms guide doctors toward the most effective dose provided by each radioactive seed; the shape of

the organ being treated; the locations of tumor cells within the organ and critical structures for which radiation dose should be limited; the sensitivity of tissues to radiation; and the expected shrinkage of the organ after treatment. The system's goal is to provide consistent tumor-killing radiation doses to the tumor cells while limiting potentially damaging doses to nearby critical structures.

The real-time intraoperative planning system eliminates pre-operation simulation and post-implant imaging analysis. Based on the range of costs of these procedures, Lee estimates conservatively that their elimination nationwide could save on the order of \$450 million a year for prostate cancer care alone.

Effectively, this work improves the survival rate of patients with prostate cancer, reduces the side effects of treatment, and lowers costs to the healthcare system.

The real-time intraoperative planning system is licensed to a medical software company, and its distribution will allow achievement of consistent treatment planning across different clinics, thus reducing the variability in the quality of treatment plans.

Lee has also been working with medical specialists on advancing treatments for breast, lung, cervical, brain, and liver cancers, as well as early diagnosis of disease for proper intervention.

Each year, INFORMS' Franz Edelman Award competition recognizes outstanding examples of operations research projects that have transformed companies, entire industries, and people's lives. Operations research uses advanced analytical methods to help make better decisions and is a disciplined way by which management can improve organizational performance in a wide variety of situations, in nearly any type of organization in the public or private sector.

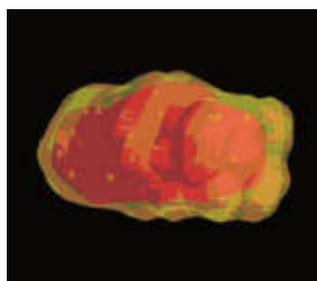
Lee's honor is the first time that INFORMS has awarded the Edelman prize for a medical treatment. Further, the win demonstrates how operations research and mathematics are increasingly bringing improvements to healthcare, not only in the areas of policy, finance,

*"Eva Lee, in conjunction with Memorial Sloan-Kettering Cancer Center, has made an extraordinary difference in the health and well-being of cancer patients."*

~ Chelsea C. White III, School Chair

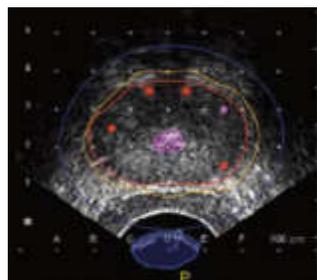
and public health, but in diagnosis and treatment as well.

This year's Franz Edelman finalists included Coca-Cola, the U.S. Coast Guard, Hewlett-Packard, and Daimler-Chrysler. Past winners of the award include Motorola, Merrill Lynch, Canadian Pacific Railway, and IBM.



This image shows the three-dimensional dose distribution of the prostate upon completion of implanted seeds.

Based on patient tests, Lee's inverse planning system uses 15% fewer seeds.



This figure shows the Prowess graphical user interface that displays the dose distribution of a treatment plan obtained from the optimization system. The figure displays the contour of the prostate (red), the urethra (purple), and the rectum (blue). The prescription dose contour is shown in brown; pink and red dots indicate placement of radioactive seeds.

# GLOBAL RED ALERT

## Humanitarian Relief Logistics Research at the Stewart School of ISyE

by Ozlem Ergun, Pinar Keskinocak,  
and Julie Swann



Professors Julie Swann, Ozlem Ergun, and Pinar Keskinocak review a presentation on humanitarian relief logistics.

*“Many [crisis response] inefficiencies could have been avoided with advanced planning and capacity building, as well as effective management of response activities.”*

In the last few years, the world has seen an increase in major natural disasters—the tsunami in South Asia, the earthquake in Pakistan, Hurricane Katrina in the Gulf Coast area, and most recently, the earthquake in Java, Indonesia.

Unfortunately these catastrophes are not anomalies, but rather a pattern of increased volatility often attributed to changing weather patterns and human occupation of hazardous locations—and they are expected to continue.



South Asia Floods, August 2004. Dhaka Bangladesh DMP Project; A CARE Bangladesh assistant administrator who is busy in the field getting research and feedback from recipients, helping to improve CARE's services.

PHOTO CREDIT: JOSH ESTEY/CARE

In addition to these natural disasters, man-made crises arising from terrorist activities and war, often have similar effects on populations in terms of dangerous conditions and lack of basic necessities, including shelter, water, food, and safety.

Humanitarian relief aid is typically provided on an urgent basis in response to a humanitarian crisis through

governments and global aid agencies. Unfortunately, past catastrophes have highlighted the severe difficulties that these organizations have in planning for, and responding to, these events. Examples are well-known: advanced warning systems for the tsunami could have reduced the injuries and fatalities; agencies had difficulty reaching Pakistani earthquake victims due to weather and damaged infrastructures; and levees in New Orleans were inadequate, officials were slow to respond with help, and the aid that was procured and transported mismatched the needs. Many of these inefficiencies could have been avoided with advanced planning and capacity building, as well as effective management of response activities.

In response to this, the H. Milton Stewart School of Industrial and Systems Engineering's Supply Chain & Logistics Institute (SCL) established a Center of Focused Research on Humanitarian Relief Logistics to help improve the human condition through advanced science and technology. The Center, co-directed by Professors Ozlem Ergun, Pinar Keskinocak, and Julie Swann, will coordinate various research and educational efforts to improve humanitarian relief planning, capacity building, and effective management of response activities.

The Stewart School of ISyE's experience in improving logistics in private industry will be a significant strength to the humanitarian field. To address the many different kinds of issues which span across various disciplines, Ergun, Keskinocak, and Swann have pulled together an interdisciplinary team that includes other faculty and researchers across Georgia Tech's campus and beyond. They are also partnering with

government agencies, nongovernmental organizations (NGOs), and private corporations. These partnerships are essential because they allow the humanitarian relief team to collect data and identify research areas that can make a greater impact. A special emphasis has been placed on building a bridge between industry and humanitarian relief aid agencies. The activities of the Center will include research, education, training, and outreach.

## Researching the Infrastructure

Within the research, significant focus areas include: (1) design of the supply chain and distribution network, (2) transportation and dynamic control, and (3) demand management, including inventory and forecasting decisions. Projects will also include an evaluation component, as this is a crucial step towards assessing the systems, as well as the impact to the end user.

Another important area is decentralization. When a natural, security, or health crisis occurs, often the hierarchical infrastructure, like transportation and communications networks, breaks down and the people responding to the crisis manage the recovery operations through locally based activities. This oftentimes forces the individuals to make localized decisions without observing other parts of the system. Therefore, there is a real need to align the centralized modeling and optimization tools that are used in the planning stages with the decentralized mode in which many systems operate.

By explicitly incorporating the decentralized behaviors into the optimization models, the network and operational tools can be designed to achieve performance closer to the optimal system. This technique can help ensure that the optimization models are achieving the desired effect, particularly when control may be distributed throughout a network or when the network is constructed by independent people.

## Real-World Projects, Real-World Impact: Humanitarian Research Course

In spring 2006, a new graduate-level class in humanitarian research was developed. The course, led by Keskinocak, focused on the applications of operations research and management science with public impact for non-profit organizations. The course topics included humanitarian logistics, preparedness (food and vaccination plans) for pandemic response, pre-positioning (preparedness) for humanitarian response, and vaccine procurement.

Students participating in the course were divided into teams to research the following real-world projects in collaboration with faculty advisors and nonprofit organizations.

### *Pandemic Response*

**Research team:** Students Jad Allam, Ali Ekici, Shaudi Hosseini, Xiao Liu, and Randeep Ramamurthy, advised by Professors Keskinocak and Swann and motivated by discussions with the Centers for Disease Control and Prevention and the American Red Cross

When an epidemic occurs, it spreads in a limited area and affects the population in that local area. However, a pandemic could affect the entire world. Given the increased instances of the Avian flu over the past few years, experts think that a pandemic flu might happen in the near future. Epidemiologists have warned that one in every three people on the planet could be infected during a pandemic, with many of them requiring hospitalization.

*The Humanitarian Relief Center's research activities will be coordinated with education, training, and outreach activities to fulfill the much needed pipeline of expertise in this area.*

With this in mind, the pandemic response team constructed a model to predict the number of people infected and geographical locations, using data for the state of Georgia. They developed optimization models to design networks to distribute food and vaccines to affected populations, and they analyzed the number and location of clinics to be set up including staffing requirements and logistics needs.

### *Pre-positioning Inventory for Emergency Response*

**Research team:** Students Serhan Duran, Marco Guterrez, and Adaora Okwo, advised by Professor Keskinocak in collaboration with CARE-USA

In humanitarian supply chains, demand is complicated by many unknown factors, such as the location, size, and timing of disasters. The research team developed a pre-positioning strategy and compared it, in terms of its effectiveness and timeliness of response, with the current practices of sending resources through local and global suppliers.

### *Quantitative Models for Vaccine Procurement*

**Research team:** Students Aykagan Ak, Jessica Heier, and Clarence Wardell, advised by Professors Ergun and Keskinocak in collaboration with the Pan American Health Organization (PAHO)

PAHO, through its Revolving Fund for Vaccine Procurement, acts as an agent for the purchase of vaccines and syringes for thirty-seven countries in South America. PAHO's goal and subsequent challenge is to reduce costs while improving service. The research team examined PAHO's current forecasting and procurement process, explored the potential benefits of using bundle bids, and identified opportunities for reducing costs and improving service.

### *Education, Training, and Outreach*

The Humanitarian Relief Logistics Center's research activities will be coordinated with education, training, and outreach activities to fulfill the much needed pipeline of expertise in this area. Along with the graduate class, the humanitarian research team will host workshops, seminars, learning opportunities, and short courses.

Recently Steve Hansch, a researcher who has twenty-five years of experience working in the humanitarian industry and teaches courses in humanitarian logistics, spoke to a standing room only crowd of faculty,

*The graduate class in humanitarian research poses for a group shot after completing final project presentations.*

*Back row, from left to right: Julie Swann, Jad Allam, Reidar (Ray) Hagthvedt, Serhan Duran, Ali Ekici, Pinar Keskinocak*

*Front row, from left to right: Clarence L. Wardell III, Aykagan Ak, Shaudi Hosseini, Adaora Okwo, Jessica L. Heier, Ozlem Ergun*

*Not pictured: Randeep Ramamurthy, Marco A. Gutierrez, Xiao Liu, and Faramroze Engineer*



students, and alumni at the Stewart School of ISyE. Hansch drew from his extensive field of work implementing and developing disaster response programs for a wide variety of NGOs. He provided a rich presentation on a global and historical sweep of the humanitarian aid business as well as key research issues at the forefront of how NGOs and UN agencies are trying to improve operations.

John Vande Vate, professor and director of the Stewart School of ISyE's Executive Master's in International Logistics (EMIL) program, along with Keskinocak and Swann, participated in meetings of the Inter-Agency Working Group (IWG) on emergency capacity building. IWG was formed in 2003 by Oxfam GB, Save the Children-US, World Vision International, Catholic Relief Services, the International Rescue Committee, CARE International, and Mercy Corps to better coordinate their efforts. Vande Vate also instituted partial scholarships to EMIL's degree program for individuals working in the humanitarian field. (Read more on page 10.)

Today, graduate student Marco Gutierrez (learn more about him on page 8) is advancing the relationship with CARE, through a grant from philanthropist Greg Block, to perform a general supply chain capabilities assessment. He will conduct an evaluation of current logistics practices and assist in preparing a supply chain improvement plan with an overall objective of enhancing its emergency preparedness and response capacity. The grant supports Gutierrez's work as well as CARE's membership in the Leaders in Logistics program with the SCL, where organization leaders partner with SCL to support research and educational programs within their respective fields.

Doctoral student Moin Islam will be spending the summer in Ghana, Zambia, and other parts of Africa. Islam, advised by Swann and Vande Vate, will work with World Vision to learn more about the basic tenets of supply chain management while learning about the realities of delivering humanitarian relief. Islam's efforts will be jointly supported by World Vision and EMIL.

Swann has traveled to Africa to present at a Supply Chain Transformation workshop at World Vision International as well as to El Salvador to discuss ways that private industry can improve humanitarian response. Additionally, in November, Vande Vate will speak at the upcoming INFORMS conference on the

four major strategies employed by humanitarian organizations in delivering relief. Some of the projects that were part of the graduate class led by Keskinocak will also be presented at the conference.

The Humanitarian Relief Logistics Center plans a number of case studies focused on both private and public organizations and their response to disaster logistics, such as The Home Depot's hurricane response efforts. (See spotlight on alumnus Paul Raines on page 9.)

## Effecting Change

Disaster logistics is an instrumental tool for humanitarian organizations, however, it can apply to private industry as well, especially to companies that take leadership in social responsibility. Working with the Center of Focused Research on Humanitarian Relief Logistics in the Stewart School of ISyE is one way to have a positive impact on the world. This interdisciplinary center fills a critical need in the several-billion-dollar humanitarian relief sector. The overall area needs a tremendous amount of work, so there are many opportunities to have substantial impact.



*Natural disasters cause billions of dollars in damage, but the impact on the lives of those affected is immeasurable.*

*For questions or to become involved in the Humanitarian Relief Logistics Center, contact the humanitarian relief team at [humlog@isye.gatech.edu](mailto:humlog@isye.gatech.edu). For development opportunities, contact Nancy Sandlin at 404.385.7458 or [nsandlin@isye.gatech.edu](mailto:nsandlin@isye.gatech.edu).*

# ISyE Students



## Jessica Heier

Jessica Heier, from Quinter, Kansas, is a second-year PhD student in the H. Milton Stewart School of Industrial and Systems Engineering. Heier came to Georgia Tech to learn about systems and industrial engineering and to work in humanitarian relief. When she arrived at Georgia Tech, she actively sought out faculty who would be interested in working on humanitarian relief logistics. “I just knew that if I could master the operations research, I would then apply it to relief,” she says. Heier was delighted when she learned about the development of the graduate class in humanitarian research and notes, “It really is an opportune time for me to be here.”

In ISyE Professor Pinar Keskinocak’s class, Heier worked with two other students, Aykagan Ak and Clarence

Wardell, on a research project for the Pan American Health Organization (PAHO). “We worked on real issues and we needed to deliver something that’s going to make a difference for the agencies that we are working with,” says Heier. “We looked at the things we can do for PAHO, but then we also looked at the challenges.”

According to Heier, the biggest difficulty was “finding a piece to bite off to actually make a difference in one semester.” But she says that it is what made this project so appealing, along with the idea of looking at real problems in application areas that have not been researched before.

She notes, “We know that our project is not going to sit on a shelf. It’s going to be something that someone can use and that will have an impact on people’s lives, which is why I am here. It’s really exciting for me and for a lot of the students.”

“The Stewart School of ISyE faculty have really helped me in my work with relief logistics. They have deep expertise in logistics and optimization problems and have provided great opportunities for conversations about applying those skills in relief logistics and identifying important research questions,” says Heier. “They have also been extremely helpful and proactive in pursuing contacts with nonprofit agencies.”

After graduating, Heier plans to use operations research and industrial engineering specifically for relief logistics and pursue a career in academia. “As much as I love the research and love to work on these problems, I also really love to teach others about this work,” she says.

*“We know that our project is not going to sit on a shelf. It’s going to be something that someone can use and that will have an impact on people’s lives.”*



## Marco Gutierrez

Originally from Mexico, Marco Gutierrez moved to the U. S. to attend college—first at Arizona State University for his undergraduate degree and now at Georgia Tech. Gutierrez is currently a third-year PhD student who is basing his dissertation on humanitarian logistics.

Because of Gutierrez’s interest in humanitarian relief, his advisor, Professor John Vande Vate, connected him with CARE USA to begin in-

*“We are talking about analyzing a problem worldwide, covering a spectrum of humanitarian crises and local conditions.”*

vestigating the kinds of problems the organization faced and the kinds of research needed in that area. At the time, CARE USA was developing an emergency preparedness planning (EPP) methodology and wanted to work with supporting countries to adopt the EPP. So to get an understanding of the issues faced by CARE, Gutierrez traveled two years ago to Central America with the organization to observe its efforts and help with translations.

“The most important thing that I became aware of was the magnitude and complexity of the problems they faced. Just responding to a disaster itself is a very complex problem,” he says.

Gutierrez chose to continue his work with CARE for his class project in Professor Pinar Keskinocak’s graduate class in humanitarian research. Working with two other students, Serhan Duran and Adaora Okwo, he picked up the issue of evaluating logistics preparedness by researching the impact of a warehouse pre-positioning network for emergency supplies.

“Working on real-world issues is very different than other research problems that I’ve been involved in, and in this case, the potential impact is so big that it’s just a lot more motivating. We are talking about analyzing a problem worldwide, covering a spectrum of humanitarian crises and local conditions,” he says.

CARE is currently sponsoring Gutierrez, through a grant from philanthropist Greg Block, to perform a general supply chain capabilities assessment.

After graduating, Gutierrez would like to work in either academia or consulting. He says, “In either of those two options, I will continue being involved in humanitarian logistics. It will remain one of my main areas of interest.”

## SPOTLIGHT ON HUMANITARIAN RELIEF

# ISyE Alumni

## Shireen Khan

**S**hireen Khan, IE 1993, became interested in international development when she was working at AT&T. "I was spending all of my free time on community service activities, and I was keen to have an international assignment. I thought I might do well to focus on humanitarian efforts as my main job," she recalls. So Khan moved to Ghana to pursue international development and journalism. Her first assignment was managing an emergency food security project. "My training as an industrial engineer has informed every assignment I have undertaken. I think in terms of processes and optimization of the systems I am working in, with the largest system of course being the global system. The job in Ghana involved organizing a logistics and distribution system to deliver seed to farmers," says Khan. She also worked as a journalist in Ghana and then moved to work for CNN International.

After obtaining her master's degrees in business and international affairs from Columbia University in 2002, Khan moved to Afghanistan to work with the United Nations and other agencies in the economic development arena. Following the devastating 2004 tsunami in Asia, Khan served as local economic recovery advisor to the U.S. Government Representative for Aceh Reconstruction to find solutions for business recovery.

"While the field of humanitarian relief is becoming more sophisticated, each new complex emergency presents new challenges in administering aid. Focusing the brainpower and expertise of the Stewart School of ISyE on improving humanitarian relief efforts has the potential to save many lives, ease suffering, and reduce waste. I have a lot of faith in the School's ability to make a significant impact," she says.

Currently, Khan is a Global Leadership Fellow at the World Economic Forum, where she works to promote public-private partnerships to achieve global international development goals. She advises balance when getting involved in international development work. "It is important to keep in mind that while we bring knowledge, good intentions, and experience to these situations, the emphasis in any endeavor must be on enabling and empowering the people one is aiming to help," she says.



*"While the field of humanitarian relief is becoming more sophisticated, each new complex emergency presents new challenges in administering aid."*

## Paul Raines

**P**aul Raines, IE 1985, is the recently appointed executive vice president of U.S. stores for The Home Depot and oversees more than 1,900 stores across the country. In his former role as Southern Division president, he served as The Home Depot's "Hurricane Chief" to oversee preparations for responding to catastrophic events.

To maximize efficiency in response to catastrophes, Raines and his team conduct a postmortem after each disaster to review operations. From Florida's four hurricanes in 2004, he learned a lot about what merchandise was in short supply and how events unfold.

In 2005 as he prepared for Hurricane Katrina, his team pre-staged extra supplies and generators to run the stores in the storm's strike zone. Raines' team started mobilizing four days before Katrina hit. Two days before the hurricane's landfall, maintenance teams battened down stores in the projected path, while electrical generators and hundreds of extra workers were moved into place around the path. At the company's Hurricane Center in Atlanta, staff from the maintenance, human resources, and logistics divisions worked eighteen hours a day to cut through logjams and get supplies in place.

As the hurricane neared, his team transported and lodged more than 1,000 relief associates to work at stores in the affected areas of Louisiana and Mississippi. Based on the information collected during the 2004 storms, Raines identified what merchandise was in short supply. Immediately following Katrina's landfall, he was prepared and quickly dispatched the first response phase with products like insecticides, water, and diapers.

He also has learned how to secure stores faster and tighter in the hurricane's path in order to get stores up and running as soon as possible after the event. "We always take tremendous pride in being able to be among the first responders," says Raines.

Raines and his team are always on watch. With every new catastrophic event, he says, "There are new lessons to learn." After Katrina, in some cases, he could not get gasoline for associates to drive to the stores, so some of the associates had to stay in their cars overnight. For the next hurricane, he observes, "I'm making sure that there will be portable gas on hand."



*"With every new catastrophic event, there are new lessons to learn."*

# EMIL Offers Scholarships and Hands-on Learning Approach

The humanitarian relief community is now recognizing the importance of increasing staff expertise in order to close the gap with the commercial world in terms of global logistics and supply chain practices.

Yet, humanitarian relief organizations are typically evaluated in terms of how much of their money goes to the victims rather than to overhead, and continuing education is generally considered overhead. Because there is such a strong need for educational development in the humanitarian relief community and little money to support that effort, the Executive Master's in International Logistics (EMIL)

program offers a limited number of scholarships for individuals who work in the field of humanitarian logistics.

"The humanitarian relief community is under pressure to professionalize its practices," says Professor John Vande Vate, EMIL's executive director. "It's not enough to have the best intentions anymore. Donors are increasingly demanding best practices as well. The Stewart School of ISyE and EMIL teach those best practices."

As the premier international logistics and supply chain strategy executive master's degree program in the world, EMIL offers a hands-on learning approach where participants complete real-world, current business assignments on a global scale. Rather than pursuing a traditional master's thesis, EMIL participants work

in teams to complete an eighteen-month global supply chain project that identifies opportunities across the global supply chain to remove costs, speed cycle time, or enhance revenue.

"It is the program participants' genuine interest in improving the supply chain and the cohesive work environment that make the EMIL program so attractive," says Vande Vate. "When you bring together motivated executives from the world's leading organizations to learn and to problem solve, the environment becomes intoxicating and the results are limitless."

The individuals from the humanitarian relief community who have participated in EMIL have added another dimension and insight to the already dynamic energy of the program. "The humanitarian relief community faces challenges that simply aren't in the textbooks," notes Vande Vate. "They typically have boots-on-the-ground experience in the toughest emerging markets under the most trying of

circumstances. They deal with some of the most sensitive cultural and political issues and manage what you might call the most extreme last-mile logistics. That experience is invaluable to the rest of the class whose companies are increasingly turning to these markets as places to source, manufacture, and in many cases, sell. And just as important, humanitarian relief professionals bring a sense of purpose and social responsibility to a class that might otherwise be dominated by the bottom line."

The first recipient of the EMIL Humanitarian Relief Scholarship was Heidi Cerrud, who graduated from the program in 2005.

"Since emergency situations are often precarious, I needed to be as educated as possible on supply chain and logistics processes," says Cerrud, who at the time was procurement officer at a regional logistics unit for the International Federation of the Red Cross and Red Crescent Societies in Panama. "Through these alliances and the EMIL program's content, the Red Cross could jump start its new emergency operations strategies that enables the best practices to optimize the supply chain during emergency operations in order to assist the most vulnerable ones."

The second recipient of the EMIL Humanitarian Relief Scholarship, Kristof Choiniski, also came from the International Federation of the Red Cross and Red Crescent Societies, this time from Denmark.

"The Executive Master's in International Logistics program increased my logistics knowledge, taught me new skills, and prepared me to operate in a global supply chain," says Choiniski. "However, working in teams together with some of the most experienced individuals from Fortune 500 companies proved to be one of the most valuable and rewarding aspects of the program."

To further investigate and advance topics of interest to the humanitarian relief community, Vande Vate is working with Professors Ozlem Ergun, Pinar Keskinocak, and Julie Swann on the educational, training, and outreach efforts for the Center of Focused Research on Humanitarian Relief Logistics. (See cover story on page 4.) Vande Vate is also collaborating with CARE and World Vision, two of the leading members of the Inter-Agency Working Group (IWG). These project teams will focus on creating effective solutions to issues in humanitarian supply chain management and logistics, developing best practices in emergency situations, and the much needed curricula for relief staff training, as well as creating more effective ways to manage knowledge. IWG was formed in 2003 by Oxfam GB, Save the Children-US, World Vision International, Catholic Relief Services, the International Rescue Committee, CARE International, and Mercy Corps to better coordinate their efforts.

"When you unite together for a common purpose, capacity expands," says Vande Vate. "Within this new expanded capacity, new ideas are developed and problems are solved to ensure that we stay on the cutting edge in effective management of response activities."

For more detailed information on EMIL's initiatives, visit [www.emil.gatech.edu](http://www.emil.gatech.edu).



Investigating best practices in supply chain and logistics processes helps in effective management of emergency response activities.

# The Logistics Institute Changes Name and Identifies Eight Centers of Focused Research

BY H. DONALD RATLIFF, EXECUTIVE DIRECTOR, SUPPLY CHAIN & LOGISTICS INSTITUTE

In the fall of 2006, The Logistics Institute (TLI) at Georgia Tech's H. Milton Stewart School of Industrial and Systems Engineering changed its name to the Georgia Tech Supply Chain & Logistics Institute (SCL).

This expanded name reflects the comprehensive research and education provided by SCL ranging from global supply chain strategies to logistics technologies and operations. SCL also established eight Centers of Focused Research to encourage industry linkage and provide world-class research and education. These centers are flagship programs that sustain and build upon the existing reputation of excellence in supply chain and logistics developed in the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Tech over the past fifty years. The centers form a network within SCL where faculty and students interact and share knowledge. Each center has one or more directors with an international reputation in the area of focus. (See top right sidebar for a list of these centers.)

## Changing Perspectives

For more than sixty years, Georgia Tech has provided a leadership role in the evolution and growth of supply chain and logistics as a field. During this time, the field has evolved from an initial focus on improving relatively simple, but very labor-intensive, processes to the present day engineering and managing of extremely complex global networks. The Logistics Institute was created in 1992 by consolidating the wide range of logistics-related research and education efforts that have helped the Stewart School of ISyE establish its number one ranking among all universities in the nation. This consolidation immediately created the largest logistics research and

education organization in the world. The need for a comprehensive research and education effort to address the exploding computer technology innovations that were impacting logistics was the primary motivation for the merger. To better understand the Institute's direction and motivation for the name change, it is useful to examine the evolution of supply chain and logistics as a field, particularly at Georgia Tech.

## The Roots

Both industrial engineering and operations research have their roots in logistics. Fredrick Taylor, who wrote *The Principles of Scientific Management* in 1911 and is considered the father of industrial engineering, focused his early research on how to improve manual loading processes.

Operations research began when scientists demonstrated the value of analytics in the study of military logistics problems in the 1940s as a result of the complex requirements of World War II. While industrial engineering and operations research have each tried to maintain separate identities, many of their biggest successes have occurred when used in an integrated framework to address supply chain and logistics issues. Increasingly this is referred to by industry as "Supply Chain Engineering."

Georgia Tech's focus on logistics can be traced back

*Continued on page 12*

## Eight Centers of Focused Research:

### Center for China Logistics

*Co-directors: Jiangan "Jim" Dai and Chen Zhou*

### Center for Global Transportation

*Co-directors: Alan Erera and Chelsea C. White III*

### Center for Healthcare Logistics

*Co-directors: Paul Griffin and Martin Savelsbergh*

### Center for Humanitarian Relief Logistics

*Co-directors: Ozlem Ergun, Pinar Keskinocak, and Julie Swann*

### Center for Manufacturing Logistics

*Director: Leon McGinnis*

### Center for Resource Scheduling

*Co-directors: Ellis Johnson and George Nemhauser*

### Center for Supply Chain Strategy

*Co-directors: John Langley and H. Donald Ratliff*

### Center for Warehousing & Distribution

*Director: John J. Bartholdi III*



Loading road freight to rail at Norfolk Southern's Intermodal Terminal.



to the founding of the School of Industrial Engineering in 1945. Over the succeeding sixty-plus years, Georgia Tech has always had a large group of faculty who were recognized as leaders in what was considered at that point in time to be the forefront of research and education in the field of logistics. However, this forefront has dramatically changed in both breadth and depth during this period.

## The Early Years

In the 1940s and 1950s, the focus of logistics research was on how to use mechanization (e.g., pallets and pallet lifts) to improve the very labor intensive processes of material handling and how to take better advantage of space, using racking and improved warehouse design and layout. The “unit load” concept gained popularity, and the use of pallets became widespread. In the mid-1950s, this concept was extended to transportation with the development of intermodal containers together with ships, trains, and trucks to handle these containers. This was a prerequisite for the supply chain globalization that was to come much later. Although the terms *warehousing* and *materials handling* were used to describe many of these efforts, this work could be viewed as fundamental applications of industrial engineering rather than as a discipline of its own.

By the 1960s, a clear trend had developed in shifting more time-dependent freight transportation to truck rather than rail. This led to the need for joint consideration of warehousing, material handling, and freight transportation, which emerged under the label of “Physical Distribution.” The National Council of Physical Distribution Management was formed in 1963 to focus industry attention on this area and quickly became the predominant organization in the field. Academic research and education followed this trend to satisfy the growing industry recognition of the needs in this area. This area gained much wider recognition in both industry and academia due in large part to the fundamental

paradigm change that occurred during the 1960s and 1970s with regard to computers.

Prior to the 1960s, virtually all transactions and record-keeping were done manually. The computerization of this data opened the door to a huge opportunity for innovations in logistics planning, from randomized storage in warehouses to optimization of inventory and truck routing. The technologies, particularly those from operations research, that researchers had up to this point only been able to examine in theoretical models had now become much closer to reality. However, there were still many difficult research issues to resolve in the transition from theory to practice. In the late 1970s and early 1980s, this led to the creation at Georgia Tech of the Production and Distribution Research Center, the Material Handling Research Center, and the Computational Optimization Center. Each of these centers was focused on a different aspect of what this new computer technology made possible.

## Logistics Comes of Age

The 1980s marked the beginning of a sea of change in logistics. The emergence of personal computers in the early 1980s provided tremendously better computer access to planners and a new graphical environment for planning. This spawned a flood of new technology, including flexible spreadsheets and map-based interfaces that enabled huge improvements in logistics planning and execution technology. The Georgia Tech research centers were at the forefront of research for this new technology. The Production and Distribution Research Center was the early innovation leader in combining map interfaces with optimization models for supply chain design and distribution planning. The Material Handling Research Center provided leadership in developing new control technology for material handling automation. The Computational Optimization Center developed new large-scale optimization algorithms that enabled solution of previously intractable airline

scheduling problems. Much of the methodology developed in these centers rapidly began to find its way into commercial technology.

Perhaps the most important trend for logistics in the 1980s was that it had begun to get tremendous recognition in the industry as being very expensive, very important, and very complex. Company executives became aware of logistics as an area where they had the opportunity to significantly improve the bottom line if they were willing to invest in trained professionals and new technology. In 1985, the National Council of Physical Distribution Management changed its name to the Council of Logistics Management (CLM). The reason given for the name change by the new CLM was “to reflect the evolving discipline that included the integration of inbound, outbound, and reverse flows of products, services, and related information.” Prior to this, *logistics* was a term that had been used almost exclusively to describe the support of military movements.

## The Technology Revolution

The logistics boom was fueled further in the 1990s by the emergence of enterprise resource planning (ERP) systems. These systems were motivated in part by the successes achieved by material requirement planning systems developed in the 1970s and 1980s; in part by the desire to integrate the multiple databases that existed in almost all companies and seldom “talked” to each other; and in part by concerns that existing systems might have catastrophic failures as a result of not being able to handle the year 2000 rollover date. In spite of some significant problems in getting the ERP systems installed and working, by the year 2000 most large companies had installed ERP systems. The result of this change to ERP systems was a tremendous improvement in data availability and accuracy. The new ERP software also dramatically increased recognition of the need for better planning and



integration among logistics components. The result was a new generation of advanced planning and scheduling (APS) software.

Many of the concepts and tools developed at Georgia Tech were central to the emergence of the new generation of optimization-based APS software. However, it also became clear that truly taking advantage of the remarkable advances in computing and to address the problems of integration among logistics components required a broader focus than present in any of the existing logistics-related centers at Georgia Tech. It also became clear that there was a tremendous need to better link research, education, and practice. These were the prime motivators for the merger of the Georgia Tech research and professional education efforts into The Logistics Institute in 1992.

## Globalization and Supply Chains

The widespread recognition of the term *supply chain* has come primarily as a result of the globalization of manufacturing since the mid 1990s, particularly the growth of manufacturing in China. U.S. imports from China grew from about \$45 billion per year in 1995 to more than \$280 billion per year in 2006. The focus on globalization accentuated the need for logistics strategies to deal with complex networks including multiple entities spanning multiple countries with diverse control. There has been an increasing trend to use the term *supply chain* to refer to strategic issues and *logistics* to refer to tactical and operational issues. This growing association of supply chain with strategy is reflected in the Council of Logistics Management's changing its name to the Council of Supply Chain Management Professionals in 2005. They make the distinction that "*logistics* is that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information

between the point of origin and the point of consumption in order to meet customers' requirements." They continue that "*supply chain management* is the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole."

The Georgia Tech supply chain and logistics effort has grown and expanded its scope over the years so that it now includes broad expertise in supply chain strategy and supply chain management to compliment its traditional focus on the engineering issues in supply chain and logistics. These efforts have expanded globally with an established program in Singapore and developing programs in a variety of other countries. The name "Supply Chain & Logistics Institute" reflects the breadth and depth of the Institute's expanding mission of developing technology and people to address the rapidly evolving engineering and management needs of the supply chain and logistics field.

## The Future of Supply Chain and Logistics

Since the 1980s, computer technology has advanced at such a phenomenal rate that it is currently far ahead of the ability of the supply and logistics field to adequately utilize the new technologies. Given the extent of Internet usage today, it is hard to believe that Microsoft's Internet Explorer 1.0 was released in 1995. The communication capabilities have fundamentally changed the way we think about communications and information sharing. However, supply chain and logistics planning is still primarily based on the distributed models that came as the result of personal computers.

There is no question that academic research can enable a new generation of supply chain and logistics planning

technology based on centralized planning with distributed collaboration. These technological advances can provide tremendous value in addressing traditional supply chain and logistics areas such as warehousing and distribution, transportation, and manufacturing logistics. However, there are also many nontraditional areas, such as healthcare logistics and humanitarian logistics, which can get great value from building on the concepts and technologies that have already proven successful in the traditional supply chain and logistics areas. Finally, there are extremely valuable insights to be gained by systematically studying the supply chain and logistics performance of companies across multiple industries and countries. All of these are activities where the Supply Chain & Logistics Institute, in conjunction with our industry partners, will continue to provide a leadership role in research and education.

## Upcoming Events in the Supply Chain & Logistics Institute

The Supply Chain & Logistics Institute offers a comprehensive curriculum of short courses providing coverage of all major logistics and supply chain management topics. Upcoming courses include:

- Warehousing Short Course, September 10-14, 2007
- Third-Party Logistics, October 2-5, 2007
- Finistics: Financial-Supply Chain Management Connection, November 5-6, 2007
- Warehouse/Distribution Center Layout, November 7-9, 2007
- World-Class Warehousing and Material Handling, November 13-16, 2007

For more information, call 404.894.2343 or visit [www.scl.gatech.edu/education](http://www.scl.gatech.edu/education).

# New Academic Tracks Increase Flexibility in Undergraduate Curriculum

BY PAUL GRIFFIN, ASSOCIATE CHAIR FOR UNDERGRADUATE STUDIES AND PROFESSOR

For well over a decade, ISyE undergraduates have been able to boast that they were getting a degree from the best industrial engineering program in the country.

However, in recent years there was some grumbling in that boast. With the change from the quarter system to semesters, and with additional curriculum requirements put in place from bodies such as accrediting boards, there was very little flexibility left for students. There were no regularly offered undergraduate electives, and the result was that students had little opportunity to expand their knowledge in industrial engineering topics that interested them without adding additional and expensive semesters at school. In addition to the students' concerns, this lack of flexibility also gave the H. Milton Stewart School of Industrial and Systems Engineering little room to adapt to the changing needs of the profession.

In 2004, a student-run organization in ISyE called the Student Voice Council (SVC) conducted a survey of students to determine what they felt were the major opportunities for improvement in the Stewart School of ISyE. The

number one issue that surfaced was a lack of flexibility in the curriculum. When the students in SVC presented their findings to the School, the ISyE Undergraduate Curriculum Committee (UCC) decided to consider the issue and see if other constituencies agreed. The UCC conducted a follow-up survey of ISyE seniors and alumni about the current curriculum and held focus groups with students. Both groups clearly agreed that adding flexibility would be beneficial to the overall ISyE curriculum.

With such flexible curricula, however, care must be taken to ensure that students meet accreditation requirements, such as ABET. In addition, any change to ISyE's curriculum must be designed to ensure that students are still obtaining a basic core of knowledge on which to build and that the intellectual rigor of the original program is maintained.

Flexibility can come in two forms: choice of a breadth of topics and choice of a topic to study in depth. Until one year ago, all ISyE students took the same set of courses with only one free elective.

One way to maintain intellectual rigor, to provide students an opportunity to have a choice in both breadth and depth, and to allow our curriculum to more easily adapt to new opportunities is to have a core set of courses

followed by a choice of academic tracks (with some breadth requirements). This idea was presented to students, alumni, and companies that hire our students. All populations believed study tracks would be effective and would not "water down" the curriculum. In addition, the UCC felt that this was the most effective means of achieving flexibility for students, as well as flexibility for the School to make further changes in the curriculum as needs arise.

Based in part on this and other feedback, the ISyE curriculum was completely redesigned in order to make the program more flexible while maintaining its intellectual rigor. These changes were workload neutral in that the total number of course offerings per semester remains the same as under the current curriculum. In addition, the total student credit hours remain the same as do the ISyE requirements. The essential idea was to establish a core set of courses that all ISyE students must take and a set of academic area tracks from which students may choose. There are both depth and breadth requirements for these study tracks.

The tracks listed in the new ISyE curriculum include:

- General Industrial and Systems Engineering

*Excited about the curriculum's flexibility, students discussed the advantages of the new undergraduate tracks during the recent Stewart School of ISyE Advisory Board meeting.*



< **Chris Anderson**  
General Track

< **Celia Dayagi**  
Supply Chain  
Logistics Track

**Stani Grozdeva** >  
General Track

- Economic Decision Analysis
- Manufacturing Systems
- Operations Research and Statistics
- Quality Engineering
- Supply Chain Logistics
- Health Systems (Currently under development; scheduled release in 2008)

These tracks were defined based on input from faculty, alumni, and company representatives as well as with consideration of current faculty resources. The work for the new curriculum was developed more than a year and a half ago by two undergraduate committees. This included discussions with various faculty, reviews of other respected programs, and discussions with students, alumni, and company representatives. The new curriculum was first implemented in spring 2006.

The vast majority of undergraduate students completing the Bachelor of Science in Industrial Engineering in the Stewart School of ISyE take industry positions upon graduation. The curriculum, therefore, is designed to prepare the student for the workforce and to instill a sense of importance of lifelong learning. Specifically, the design of the curriculum is to first provide students with a solid methodological foundation including mathematics, operations research, and statistics. Next, students learn industrial engineering context and the application of these methodological principles. Since graduates are hired by companies in a wide range of areas, from manufacturing systems to financial systems, the curriculum has been designed to provide students the flexibility for some degree of

specialization through the use of tracks discussed earlier. In addition, since some of our graduates (between 12 percent to 16 percent) enter graduate school, there is an option that allows for greater study of methodology through the Operations Research and Statistics track.

## Curriculum Defined

The basic academic track system works in the following way: All ISyE students are required to take a core set of ISyE courses, including: Probability, Statistics, Optimization, Stochastic Modeling, Engineering Economy, and Senior Design. A student that picks a track needs to complete three courses in the track. In addition to satisfying the three courses in a track, students are required to show breadth by taking at least one course from three different tracks. A student in the EDA track, for example, might take a course in Quality Engineering, Supply Chain Logistics, and Manufacturing Systems.

A few examples of new courses developed and offered for the track system include: International Supply Chains (taught by John Bartholdi), Sustainable Systems (taught by Valerie Thomas), Financial Engineering (taught by Steven Hackman), Advanced Manufacturing Systems (taught by Ron Billings), Operations Research in Medicine (taught by Eva Lee), Advanced Regression and Forecasting (taught by Roshan Joseph), Supply Chain Economics (taught by Paul Griffin), and Advanced Logistics (taught by Anton Kleywegt).

One of the key means of preparing students for an industry position is through the capstone design class,

Senior Design – ISYE 4106. In this class, students work in groups on an industry problem with a faculty advisor. Emphasis is placed on putting the students in an environment that acts as a culminating experience for the bachelor's degree curriculum.

## Implementation and Future Challenges

To this point, it appears that that the most popular academic tracks are Economic Decision Analysis, Supply Chain Logistics, and the General Industrial and Systems Engineering. It is too early in the implementation stage to provide specific breakdowns. Based on exit surveys given to graduating seniors, however, there is significant enthusiasm for the new system. Furthermore, feedback from companies and an external review board has been extremely positive.

Some of the current challenges of this curriculum are to continue to assess benefits and determine if we are better meeting our educational objectives and outcomes. There will also continue to be some tweaking of the offerings based on student interest, faculty capabilities, and the needs of the profession. As aforementioned, one change currently being developed is the addition of a track in Health Systems.

The Stewart School of ISyE wants to not only hold on to its top spot in the rankings but also to really be a leader in the field and help to define what industrial engineering is. We feel the new curriculum will be a small step in achieving this goal.



**Jorge Guzman >**  
Economic Decision  
Analysis Track

**Raghav  
Himatsingka >**  
Multiple Tracks,  
including  
Manufacturing

**Scott Lampert >**  
Operations  
Research and  
Statistics  
Track

## Stewart School of ISyE Welcomes New Director of Communications



Barbara Christopher

**Barbara Christopher** joined the H. Milton Stewart School of Industrial and Systems Engineering as the new communications director on March 1, 2007. She will serve, develop, and execute a comprehensive, creative communication plan for the wider School and its many programs.

Christopher looks forward to serving in this new role. "It's exciting to lead the communication efforts for the Stewart School of ISyE, especially in light of the recent rankings by *U.S. News & World Report* as the best graduate school in industrial/manufacturing for the seventeenth year in a row. I am impressed with the quality of the education offered by our top-notch faculty, the quality of research, and the caliber of students who come here. It will be a pleasure to highlight their work," she says.

Christopher has more than thirty years professional experience in the educational and nonprofit sector, with experience in the fields of communications, public relations, and event management. Coming to the Stewart School of ISyE from Georgia Tech's College of Architecture (CoA), she has worked at Tech for the past nineteen years. She oversaw the communication efforts for CoA and its centers, while holding a dual appointment as the media core manager for CoA's Center for Assistive Technology and Environmental Access.

To learn more about the Stewart School of ISyE's communication efforts, contact Barbara Christopher at 404.385.3102 or [bchristopher@isye.gatech.edu](mailto:bchristopher@isye.gatech.edu).

## McKenney and Stewart Awarded Joseph Mayo Pettit Alumni Distinguished Service Award

Each year the Georgia Tech Alumni Association's Gold & White Honors ceremony recognizes alumni who have distinguished themselves in service to the Institute. This year, two alumni of the H. Milton Stewart School of Industrial and Systems Engineering, **David M. McKenney**, PHYS 1960, IE 1964, and **H. Milton Stewart Jr.**, IE 1961, were among four alumni to be awarded the Joseph Mayo Pettit Alumni Distinguished Service Award. The Distinguished Service Award is the highest award conferred by the Alumni Association, given to an alumnus or honorary alumnus who has set a standard by exceptional and outstanding support of the Institute and the Alumni Association.



David M. McKenney



H. Milton Stewart Jr.

"Milt Stewart and David McKenney exemplify what it means to give back to Tech and the community," said chair of the Georgia Tech Alumni Association, Janice Wittschiebe, ARCH 1978, M ARCH 1980. "They were honored for their generosity and kindness in addition to the spectacular impact they have made in advancing Georgia Tech and the Alumni Association."

McKenney is chairman and chief executive officer of McKenney's Management Corporation, a mechanical contracting firm founded in 1943 by his father, John M. McKenney, MGT 1932. His son, John McKenney, IE 1990, is president and represents the third generation to manage the company. Since 1976, McKenney's has hired about 500 co-op students from Georgia Tech, and in 2005, Tech's Briarean Society named McKenney the Co-op Employer of the Year. Additionally, he was named to the School of Industrial and Systems Engineering Hall of Fame in 2002 and the College of Engineering Academy of Distinguished Engineering Alumni in 1994, and he received the Georgia Tech Young Alumni Service Award in 1974. He is a trustee of the Georgia Tech Foundation and chairman of Bobby Dodd Institute.

Stewart dedicated his career to the telecommunications industry for forty years, rising through the ranks of management before serving as chairman and chief executive officer of Standard Group Inc. (which merged with Alltel Corporation in 1999) for twenty-eight years. He earned an MBA from Emory University in 1981 and was awarded an honorary doctorate from Piedmont College in 1989. Stewart was elected to serve on the Georgia Tech Alumni Association Board of Trustees in 1988 and three years later to the Executive Committee, becoming its president in 1995. He is a trustee emeritus of the Georgia Tech Foundation, former chairman of the Industrial and Systems Engineering Advisory Board and former member of the College of Engineering Advisory Board.

In 2006, Stewart and his wife, Carolyn, in a spectacular demonstration of philanthropy, made a \$20 million commitment to Georgia Tech. In turn, the Institute named its School of Industrial and Systems Engineering in his honor. He established the H. Milton Stewart Jr. Endowment Fund for ISyE Programs in 1995 and the Stewart School Chair in 1999. He also has supported scholarships for female students coming to Georgia Tech from Habersham High School.

## CoE Honors Stewart School of ISyE Alumni

Each autumn, the Georgia Tech College of Engineering inducts new members into the Engineering Hall of Fame, the Academy of Distinguished Engineering Alumni, and the Council of Outstanding Young Engineering Alumni. The 2006 event, held at Atlanta's Westin Buckhead, brought recognition to several outstanding ISyE graduates.

"The impressive accomplishments that earned you this honor are all the more important because they so positively reflect on Georgia Tech," President G. Wayne Clough told those receiving accolades. "You and each alumni award recipient personify our alma mater's essence: a strong technological education, a competitive spirit, and a drive for excellence."

The 2006 recipients include:

### *Council of Outstanding Young Engineering Awardees*

**Julie L. Swann**, IE 1996, is an assistant professor in the Stewart School of ISyE. She received her master's and doctoral degrees in industrial engineering and management sciences from Northwestern University in 1998 and 2001, returning to Georgia Tech as a faculty member in 2002. Swann's research is focused on the modeling and analysis of problems in logistics and supply chain management with particular interests in developing tools to manage demand through pricing or revenue management. Other research interests include applications of economics and optimization to healthcare policy, as well as international humanitarian relief logistics. (See cover story on page 4). In 2002, she was awarded the Doctoral Dissertation Award from the Council of Logistics Management. She was awarded a National Science Foundation CAREER Grant in 2004, and recently one of her papers was selected as a finalist for the Shepherd Award at the Centers for Disease Control and Prevention.

**David Touwsma**, IE 1996, is CEO and co-founder of Limetree, the upscale gift stores in Atlanta. He is currently focused on developing and growing successful retail concepts, including Limetree, The Gallery, Art and Framing, and Lil' Squeeze,

## Stewart School of ISyE Joins the Vanguard Academic Partnership Program

Vanguard Software Corporation, the leader in Web-based collaborative modeling software for enterprise simulation and planning, has partnered with Georgia Tech's H. Milton Stewart School of Industrial and Systems Engineering through the Vanguard Academic Partnership Program. As part of this program, Vanguard Software donated licenses of the new Vanguard System to the School.

"We deeply appreciate this gift from Vanguard Software Corporation. The Vanguard System is a cutting-edge decision support solution and will be a valuable resource for our students and faculty," says Chelsea C. White III, the H. Milton and Carolyn J. Stewart School Chair and the Schneider National Chair in Transportation.

The Vanguard System software is intended to provide valuable student learning experiences in classrooms and computer labs as well as to help faculty advance the state of research. The Vanguard System is the first business analytics application to support modeling and simulation on an enterprise scale and to combine all the elements necessary for Web-based, enterprise-wide decision-making: collaborative modeling, knowledge-capture, and sophisticated analytics.

"ISyE is the top industrial/manufacturing engineering program in the world and we are delighted to work with its faculty to integrate the Vanguard System in the classroom curricula and research activities," says Brian Lewis, Vanguard Software's vice president of Professional Services. "It is also personally gratifying to be able to give back to my alma mater." Lewis received his PhD from the Stewart School of ISyE in 2005, working with Professors Chelsea C. White III and Alan Erera.

The Vanguard Academic Partnership Program also offers faculty members a new teaching and research outlet, the Vanguard Global Knowledge Portal. The Global Knowledge Portal is a Wiki-style, Web portal for Vanguard's free-access, shared library of models that were created by the Vanguard System user community. Through continued use and contribution, the Global Knowledge Portal has become a key resource for analytical modelers and decision-makers. It reaches a worldwide audience of academic, business, and government users. The Global Knowledge Portal can be found at <http://wiki.vanguardsw.com>.

a children's clothing boutique. Touwsma has combined entrepreneurial talents with expertise in numerous areas of business, including strategic planning, marketing, sales, and operations. Prior to

launching Limetree, he was co-founder of NetNet Services, a sales consulting and services firm. He also served as a sales executive and director of business alliances with i2 Technologies, and he has

*Continued on page 18*



The College of Engineering held its 2006 award ceremony honoring distinguished alumni at Westin Buckhead in Atlanta. From left to right: Paul Raines, Walt Ehmer, Tom Glaze, Chelsea C. White III, Larry Kelly, Michael Anderson, David Touwsma, and Julie Swann.



worked as a business consultant for Andersen Consulting. Touwsma currently serves as chair emeritus of the Georgia Tech Business Network Board of Trustees and chapter advisor for the Sigma Chi Fraternity at Georgia Tech. He is a founding board member of the Alexander Tharpe 1st and 10 organization and the recipient of the 2004 Industrial and Systems Engineering Outstanding Young Alumnus Award.

### *Academy of Distinguished Engineering Awardees*

**Michael Anderson**, IE 1979, is vice president of corporate services with Georgia Power Company. He received an MBA from Emory University. Anderson joined Georgia Power in 1979 and has since held numerous leadership positions in such areas as capital budgeting, system planning, customer operations, information technology, marketing, and external affairs. In his current position, Anderson's responsibilities include corporate safety, labor relations, fleet management, risk management, and building services. He was recruited to Georgia Power from Texas Instruments' Government Products Division in Dallas, Texas, where he authored design criteria of nuclear warhead guidance systems technology for the U.S. military.

**Walt Ehmer**, IE 1989, is president and chief operating officer at Waffle House Inc. After working as a sales engineer for the Allen-Bradley Company, Ehmer joined Waffle House in 1992 as the senior buyer responsible for food and supply purchasing. He was named director of purchasing in 1996 and also became an officer of the corporation at that time. Ehmer was named vice president of finance in 1999, chief financial officer in 2000, and vice president of staff support in 2005, before accepting his current position. He is a member of Waffle House's Stand-by Board of Directors, chair of Ozark Waffles, and a director for Yellow Sign Inc. Additionally, he has served on the Georgia Tech Alumni Association's Board of Trustees and Executive Committee and is active in the Atlanta community.

**Thomas A. Glaze**, IE 1979, is chief executive officer of Receptor BioLogix Inc. He also holds a

master's degree and an MBA from Stanford University. He has spent more than twenty-five years in the biotechnology industry, founding and managing companies in pharmaceuticals and medical devices. Glaze is founder and chair of Essentialis Inc., a new company developing obesity drugs. Additionally, he is founder and chair of Limerick NeuroSciences Inc., recently established to develop improved analgesics. He also spent one year as interim CEO of Palingen Inc., a company developing an antibody therapeutic for leukemia and lymphoma. Glaze was founder and CEO for eleven years at Metabolex Inc., a company which focuses on therapeutics for diabetes. In 1979, he founded Monoclonal Antibodies Inc., a company that focused on medical diagnostics, and he served as the company's chair and CEO until its 1991 merger with Quidel Corp.

**E. Larry Kelly**, IE 1962, is a consultant with Piedmont Air Conditioning Company. At graduation, he joined the Trane Company in LaCrosse, Wisconsin, where he was assigned to the Richmond, Virginia, sales office. In 1970, he joined the McCracken Supply Company in Raleigh, North Carolina. Kelly purchased Piedmont Air Conditioning Company in 1972. Piedmont has several additional North Carolina offices. He is now a consultant to Piedmont, which gives him more time for outside activities, such as traveling, golf, racquetball, and fishing. He was named Entrepreneur of the Year in Raleigh in 1986.

**Joseph C. Mello**, HS 1980, is chief operating officer of DaVita, a leading provider of dialysis services for patients suffering from chronic kidney failure. Mello joined the company in the very early stages of a significant financial and operational turnaround. As of March 2006, he operated or managed more than 1,200 outpatient facilities serving approximately 100,000 patients domestically in forty-one states and Washington, D.C. As COO, Mello has responsibility for all operating units, including Information Technology, Nursing Services and Recruitment, DaVita University and Academy, Clinical Operations, Compliance Operations, BioMed Services, Reimbursement Operations, and People Services. Prior to working at DaVita, he was

president and CEO of Vivra Asthma & Allergy, the nation's largest single specialty project and portfolio management focused on chronic respiratory disease. In addition, he held various management positions with MedPartners, including senior vice president/chief operations officer, Southeastern region. He also earned an MBA in finance from Golden Gate University.

**J. Paul Raines**, IE 1985, is executive vice president of U.S. stores for The Home Depot. Raines previously was president of the Southern Division and responsible for 745 stores in eighteen southern states, the District of Columbia, Puerto Rico, and St. Thomas. He has also served as regional vice president of Operations for the Florida Region, vice president of Store Operations, director of Labor Management, and director of Operations Support for Chile and Argentina. Prior to The Home Depot, he was director of Global Sourcing for L.L. Bean for five years and was a principal in the consulting firm of Kurt Salmon Associates for ten years. A native of Costa Rica, Raines has worked throughout Latin America and the United States. He is the treasurer for the Homer Fund Inc. and sits on the board of The Home Depot Foundation and other local organizations.

### **INFORMS Awards**

The annual INFORMS (Institute for Operations Research and the Management Sciences) meeting was held last November in Pittsburgh, Pennsylvania. During the annual awards ceremony, students and faculty in the Stewart School of ISyE were recognized for their outstanding contributions in technology, research, and scholarship.

The following honors were received at INFORMS:

PhD student **Ozgun Caliskan Demirag** was a finalist in the Manufacturing and Service Operations Management student paper competition for his work on "The Effect of Customer Rebates and Retailer Incentives on Manufacturer Profitability and Sales." Demirag co-authored the paper with **Ozgul Baysar**, MS IE 2003, and ISyE professors **Pinar Keskinocak** and **Julie Swann**.



The teaching case by **Matt Drake**, MS IE 2005, PhD IE 2006 (with ISyE faculty members **Paul Griffin** and **Julie Swann**), “Keeping Logistics Under Wraps,” was selected as one of four finalists for the Seventh Annual INFORMS Case Competition.

Assistant Professor **Seong-Hee Kim** received the Simulation Society’s Outstanding Publication Award.

Assistant Professor **Eva Lee** in collaboration with Memorial Sloan-Kettering Cancer Center, the world’s oldest and largest private cancer center, received the 2007 INFORMS Franz Edelman award for their entry entitled “Operations Research Advances Cancer Therapeutics.” (See article on page 3 for complete details about this prestigious award.)

PhD student **Melda Ormeci** received second place in the Dantzig Best Dissertation Award competition for her thesis “Inventory Control in a Build-to-Order Environment.”

PhD student **Josh Reed** was awarded the prestigious Nicholson Student Paper Award for his work titled “The G/GI/N Queue in the Halfin-Whitt Regime.”

A paper by **Christina Scherrer**, IE 1999, MS IE 2001, PhD IE 2005 (with ISyE faculty members **Paul Griffin** and **Julie Swann**), “Optimization of Community Health Center Locations and Service Offerings with Statistical Needs Estimation,” was selected as a finalist for the Pierskalla Award in health applications.

School Chair **Chelsea C. White III** was named an INFORMS Fellow in recognition of his outstanding contributions to the operations research and management sciences profession.

## Faculty News

Professor **John Bartholdi**, Manhattan Associates Chair of Supply Chain Management and research director of the Supply Chain & Logistics Institute, received both a second place and an honorable mention award in 2006 from the Material Handling Industry of America and the College Industry Council on Material Handling Education.

The second place award was for his paper “The Best Place for a Cross-dock,” co-authored with Kevin R. Gue, which ran in *Transportation Science*. He received an honorable mention for his article “Using Bucket Brigades to Migrate from Craft Manufacturing to Assembly Lines,” which was co-authored with Donald D. Eisenstein and appeared in *Manufacturing and Service Operations Management*.

Associate Professor **Chin Hoong Chor** has been selected as the new director of Degreed Education and Executive Education at TLI-Asia Pacific. Chor is an associate professor with the Department of Civil Engineering at the National University of Singapore, where he has held appointments as assistant dean in the Faculty of Engineering and deputy head of Civil Engineering. He teaches transportation planning and engineering, as well as classes in the University Scholars Programme. Chor has received the Faculty Innovative Teaching Award (Gold) for his new ideas in teaching. His research interests include transportation modeling, traffic safety, and congestion management.

Professor **Augustine Esogbue** was honored in 2006 with Nigeria’s highest national merit honor, the Nigerian National Order of Merit Award. This award recognizes superior academic and intellectual attainment and is presented by the Nigerian president to deserving Nigerian citizens who have made outstanding contributions to the country’s national development in the areas of science, medicine, engineering/technology, and the arts. Further, Esogbue received NASA’s Space Flight Team Awareness Award and its Public Service Medal in 2007 for his service and leadership on the Aerospace Safety Advisory Panel that was formed in the aftermath of the Space Shuttle Columbia disaster. Esogbue was also recently elected a Fellow of the Nigerian Academy of Engineering for his contributions to dynamic programming, intelligent control, and engineering analysis of water resources and healthcare delivery systems.

Associate Professor **Xiaoming Huo** received the Georgia Tech Sigma Xi Young Faculty Award in 2006. This award is given to two faculty

members every year. In addition, Huo was interviewed by *Emerging Research Fronts* for his joint paper with David L. Donoho. The paper was published in 2001 in *IEEE Transactions Information Theory*. Interview details are available at [www.esi-topics.com/erf/2006/june06-Donoho\\_Huo.html](http://www.esi-topics.com/erf/2006/june06-Donoho_Huo.html).

Every other month, one paper per category is chosen according to the paper’s citation and the authors are interviewed about their work.

Assistant Professor **Seong-Hee Kim** has been selected as a 2007 recipient of a CAREER Award from the National Science Foundation. Her award is in the area of operations research under the Civil, Mechanical, and Manufacturing division. In addition, Kim won the 2006 INFORMS Simulation Society’s Outstanding Publication Award.

Associate Professor **Paul Kvam** was selected as an honorary fellow of the American Statistical Association in 2006.

Professor **Leon McGinnis**, Eugene C. Gwaltney Chair in Manufacturing Systems, was honored by North Carolina State University’s Pitts Department of Industrial and Systems Engineering as part of its inaugural class of distinguished alumni in celebration of the department’s seventy-fifth anniversary. He is one of twelve initial inductees.

Postdoctoral Fellow **Sunil Nakrani** was named a finalist in the United Kingdom’s Distinguished Dissertation Competition, a national competition in computing sciences. Nakrani attended Oxford University.

Professor **Craig A. Tovey** was formally approved by Oxford University to serve as co-advisor to Postdoctoral Fellow Sunil Nakrani (see above).

Professor **Jeff Wu** received an honorary professorship from the Chinese Academy of Sciences (CAS) for his research contributions in statistical theory, methods, and quality engineering, and for fostering collaborations and interactions between the statistical communities in the U.S. and China. Wu is the first statistician to receive this honor from the CAS.



## Staff News

**Valarie DuRant-Modeste** has been chosen as Georgia Tech's 2007 Outstanding Undergraduate Academic Advisor Award (Primary Role). DuRant-Modeste advises both undergraduate and graduate students and assists graduate students with degree petitions and preparation for PhD candidacy. She is also the textbook coordinator for all ISyE courses.

## Student News

PhD student **Thirthankar Dasgupta** accepted a tenure-track assistant professorship from the Harvard Statistics Department.

**Yaxin Liu**, a PhD student advised by Professor Craig Tovey, won the Outstanding Dissertation Award in the College of Computing at Georgia Tech.

The 2007 College of Engineering Student Awards Ceremony, held on April 17, 2007, recognized the outstanding accomplishments of the following ISyE undergraduate students:

**Stanislava Grozdeva** was awarded the Institute of Industrial Engineers Award.

**Kristine Johnson** received the Kurt Salmon Associates Scholarship.

**Lauren Mills** was honored with the Paul T. Eaton Memorial Award.

**Vaibhav Shah** was honored with the Alpha Pi Mu Outstanding Senior Award. Alpha Pi Mu is a full member in the Association of College Honor Societies, making it the only nationally accepted industrial engineering honor society.

The CAT Logistics Scholarship award recipients were **Niquella Brown**, **Roberto Castro**, **Joy Frazier**, **Kristine Johnson**, and **Michael Kelly**.

## Alumni News

**Richard S. Beahm**, MS OR 1980, received the 2006 Special Event Award from the National Capital Chapter of the Multiple Sclerosis Society in recognition of his fundraising and volunteer work.

**James Bunn**, IE 1973, managing director of Clear Thinking Group LLC, has been named a partner of the firm. Bunn joined the firm in 2005 as a managing director of its process and performance management practice group and will continue to direct the group's operations.

**Paul Cook**, IE 1967, has been elected to the board of directors of SciLog, a manufacturer of biotech processing equipment in Middleton, Wisconsin. Cook is active in the investment banking community and has been involved in the development of technology-based companies.

**Roger B. Cunningham**, IE 1982, was selected as the managing partner of the Atlanta-based retail strategy firm, DCB and Company Inc.

**Gregory G. Dess**, IE 1971, holds the Cecil Endowed Chair in Management at the University of Texas-Dallas. He resides in Frisco, Texas, with his wife of seventeen years and their daughter.

**Keith Hollingsworth**, IE 1985, MS IE 1992, PhD IE 1995, has been recognized by *Georgia Trend* magazine as one its "40 Under 40." He is an assistant professor in the Division of Economics and Business Administration at Morehouse University.

**Myong K. Jeong**, PhD IE 2004, now a faculty member at the University of Tennessee, has been selected as a 2007 recipient of a CAREER Award from the National Science Foundation. Jeong's award is in the area of Manufacturing Enterprise Systems under the Civil, Mechanical and Engineering division. His advisor at Georgia Tech was J.C. Lu.

**David Krieger**, MS IE 1995, has been promoted to managing director of Warburg Pincus. Krieger joined Warburg Pincus in 2000 and works in the firm's energy group.

**Richard Marinaro**, IE 1953, received the President's Call to Service Award from the President's Council on Service and Civic Participation. A former Marine and longtime volunteer of the Hobe Sound Chamber of Commerce, Marinaro has served over 5,000 hours at the Veterans Affairs Hospital in West Palm Beach, Florida.

**David McKenney**, PHYS 1960, IE 1964, has been awarded the Alco Award from the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). This honor recognizes ASHRAE members who have performed outstanding public service in the community and helped to improve the public image of the engineer. McKenney is chair and chief executive officer of McKenney's, an Atlanta-based mechanical consulting firm. He is a past president of the Atlanta ASHRAE chapter and has remained active with Georgia Tech and the Downtown Atlanta Rotary Club.

**Brady L. "Tripp" Rackley III**, IE 1992, has been appointed by Gov. Sonny Perdue to serve on the board of directors of the Georgia Technology Authority. Rackley is the chairman, founder, and CEO of Firethorn Holdings LLC. He also serves as chairman of the board for Broad-Source Inc.

**Emil Runge IV**, IE 1994, and **Julie L. Swann**, IE 1996, ISyE assistant professor, married in Charleston, South Carolina, on November 18, 2006. Runge is a founding member of political consulting firm DiSantis-Runge LLC and a real estate agent at Keller-Knapp in Atlanta, Georgia.

**Leonard Sledge**, IE 1996, has been appointed assistant director of economic development at the College of William and Mary. Before joining the college, Sledge was director of the Institutes of Excellence in the Workforce Development Services area of the Virginia Community College system.

**Jan R. Smith**, IE 1949, president of Jan R. Smith Construction Company, suffered a stroke in October 2006 at his Norcross, Georgia, office. Smith, age eighty, says that he "scared [him]self badly," but returned to work in January 2007.

**Col. LeRoy Zimmerman**, MS OR 1974, received his EdD from George Washington University in 2005. Zimmerman retired from the U.S. Army in 1993.

## Deaths

**George L. Anton**, IE 1949, MS IE 1952, of Harrisburg, Pennsylvania, died on May 25, 2006. He was the chairman of Brandseed Inc.

**Mary Elizabeth Apple**, the wife of former ISyE professor James M. Apple, died in Clayton, Georgia, on January 8, 2007. Their son, James M. Apple Jr., IE 1964, MS IE 1968, is co-founder of The Progress Group, Atlanta-based supply chain specialists.

Former ISyE professor **Col. Grif Callahan Jr.** died October 21, 2006, in Milledgeville, Georgia. Callahan joined the ISyE faculty after retiring from the military. He taught undergraduate and graduate courses related to systems engineering theory and practice, retiring in 1985. Callahan was active in promoting, supervising, and mentoring the graduate civilian education of military officers. He is the author of numerous articles and technical reports, including one of the first

papers on the use of digital computers in military decision-making, "Robot Generals," in 1953. He also established the Callahan Lecture Series at Georgia Tech.

**Verlon Swords Davis**, IE 1948, died on November 22, 2006. Davis retired from Lockheed-Georgia after a thirty-nine-year career with the company. He was a former vice chairman of the Cobb County Library board on which he served for twenty-seven years.

**Elizabeth C. Herndon**, IE Class of 1956, the first woman to attend Georgia Tech, died December 6, 2006, from pancreatic cancer. She enrolled in April 1952, as a World War II widow. In freshman chemistry, she was seated next to Albert E. Herndon, and the two were married in 1953. Herndon was forced to drop out of Georgia Tech in 1956, just two quarters shy of graduation, when their daughter Stella became ill. She ultimately completed her degree at Georgia College in Milledgeville.

**Martin B. Roberts**, IE 1951, MS IE 1958, of Decatur, Georgia, died on October 16, 2006. He earned a PhD in 1980 after recovering from a stroke and then taught at universities throughout Georgia, including Georgia Tech, Georgia State University, Agnes Scott College, and Mercer University. Roberts was a World War II veteran and became the deputy revenue commissioner of Georgia after receiving his master's degree from Tech.

**Steve Russo**, IE 1948, of Birmingham, Alabama, died on May 24, 2006.

**Maxwell F. Stowers Jr.**, IE 1957, of Winston Salem, North Carolina, died on May 6, 2006. He retired from Lucent Technologies.

**Ralphie Helvie Witt**, IE 1952, died on October 16, 2006. After graduating from the University of Notre Dame Law School, Witt worked for several law firms and the city of Atlanta as an associate city attorney.



## Stay in Touch • Drop Us a Line

The Alumni News section highlights promotions, awards, scholarships, fellowships, and publication of books. Let us hear from you! It's a good way to stay in touch with your classmates.

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