McCormick

Northwestern Engineering

Robert R. McCormick School of
Engineering and Applied Science
Northwestern University

Industrial Engineering and Management Sciences

IEMSNUs
Alumni Newsletter Fall 2007

INSIDE

Mission Statement

Our mission is to be a premier industrial engineering department in research and education. We plan to do this by

- Conducting state-of-the-art research supported by funding from granting agencies and industry;
- Providing outstanding educational experiences to our undergraduate, graduate and professional students through modern curricula, excellent teaching, and personalized advising and mentoring;
- Recruiting and retaining the best faculty possible;
- Continuously improving our undergraduate and graduate student recruitment and placement;
- Providing excellent service to all of our constituencies including students, parents, alumni, staff, faculty, university, industry, donors, and research sponsors.

IEMS Welcomes Three New Faculty

The IEMS Department is pleased to welcome three new faculty members this fall. Noshir Contractor is the first holder of the Jane S. and William J. White Chaired Professorship in Behavioral Sciences. Diego Klabjan joins as an associate professor and Paul Leonardi as an assistant professor. Profs. Contractor and Leonardi have joint appointments with the School of Communication (33% and 67%, respectively); Prof. Contractor also has a courtesy appointment with the Kellogg School of Management. Thus, these new additions move us closer to our goal of stronger cross-linking with other units of the university.


Noshir Contractor


Diego Klabjan


Paul Leonardi

Prof. Contractor comes from the University of Illinois at Urbana-Champaign, where he was a professor in the Department of Speech Communication, Department of Psychology, and the Coordinated Science Laboratory. His research, funded continuously for the past decade by major grants from the National Science Foundation and other agencies, investigates factors that lead to formation, maintenance, and dissolution of dynamically linked knowledge networks in 21st century organizational forms.

Prof. Contractor states that he is interested in "understanding the social drivers of our networks" and asking the question "why do we create, maintain, and dissolve our communication and knowledge network links and

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Michael Marasco Develops New Initiatives in Entrepreneurship and Innovation

After 20+ years working in the corporate world, Michael Marasco joined the IEMS Faculty as a clinical associate professor last January. For the past nine years, he had been an adjunct professor in the Master of Engineering Management program. This year he will be teaching courses on Engineering Entrepreneurship, Senior Design, Medical Innovation, and Marketing Issues for Engineers.


Michael Marasco

Michael has also been named the Director of the McCormick Center for Entrepreneurship and Innovation. CEI is dedicated to evolving engineering beyond the application of the sciences to the creation of businesses that capitalize on innovations. CEI focuses on interdisciplinary curriculum development, empowerment of students, faculty, and alumni, corporate and community outreach, and research. CEI is also

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Letter from the Chair


Ajit Tamhane

Welcome to the Fall 2007 issue of IEMS NUs. This is my last letter to you as the department chair as I will be stepping down at the end of this academic year. My seven-year tenure in this position has been very rewarding to me personally and professionally because of the opportunities and challenges it presented. I believe the department made significant progress in this period on all fronts, including faculty, students and their placements, national rankings of the undergraduate and graduate programs, alumni relations and giving, and upgrading of the space and facilities. Whatever modicum of success I achieved was in large part due to the advice and help I received, above all, from our faculty, and also from students, staff and alumni – especially those serving on our advisory boards; I am grateful to all of them. Nonetheless, no good and well-intentioned plan can succeed without the administration's backing. I was indeed fortunate to work with two visionary deans, John Birge and Julio Ottino, who supported the department in every way, recognizing its increasing importance in McCormick's future, in view of the changing face of engineering from traditional manufacturing to service and knowledge-based economies in which IE will play a key role.

I am very happy to tell you that Barry Nelson will be the next chair. Given Barry's outstanding record of achievements as a first-rate teacher, researcher, director of the MEM program from 1998 to 2007, and editor-in-chief of *Naval Research Logistics*, we can look forward to great leadership from him that will take the department to the next level.

As you can see from the main cover story of the newsletter, we are excited to announce the hiring of three new top-flight faculty. Prof. Noshir Contractor comes from University of Illinois at Urbana-Champaign. He is the first occupant of the Jane S. and William J. White Chair in Behavioral Sciences. Prof. Contractor is an internationally renowned researcher in organizational and social networks. His appointment will be 2/3 in IE/MS and 1/3 in the School of Communications (SoC); he will also teach in the MMM program. The other two hires are Prof. Diego Klabjan, an expert in optimization, logistics and transportation, also from University of Illinois at Urbana-Champaign, as an associate professor, and Dr. Paul Leonardi, a new PhD graduate from the Center for Work, Technology and Organization at the Department of Management Science & Engineering, Stanford University as an assistant professor (1/3 in IE/MS and 2/3 in SoC).

These new hires (plus an additional hire planned for 2007-8 in production/supply chain area) provide us with tremendous opportunities for new research and program initiatives, and raising the department's reputation even higher. The addition of Profs. Contractor and Leonardi will help revitalize the behavioral sciences area which has had a great tradition in IEMS.

Another great addition to our faculty last year was Prof. Mike Marasco, who joined as a clinical associate professor and director of the newly established Center for Entrepreneurship and Innovation (CEI). Besides leading the Center, he will teach a section of engineering entrepreneurship course (thus tripling the number of offerings of this course to meet the increasing demand) and also coordinate senior design projects in Global Health Initiative in Capetown, South Africa in collaboration with our Biomedical Engineering Department. He will also offer an innovative three-quarter course (IE/MS 495: NUvention: Medical Innovation) jointly with faculty from four schools (McCormick, Feinberg, Kellogg and Law). This is the first such ambitious course across four schools.

As we happily welcome these new faculty, we also bid a sad good-bye to Prof. Wally Hopp, who left us to join Ross School of Business at University of Michigan. Prof. Hopp was a star faculty member and he will be sorely missed. We wish him well in his new abode.

Among other faculty news: Prof. Mark Daskin was appointed to the Walter P. Murphy Chaired Professorship, Prof. Karen

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Mark Daskin Appointed Walter P. Murphy Professor


Mark Daskin

Prof. Mark Daskin has been appointed to a Walter P. Murphy Chaired Professorship from September 1, 2007 for a term of five years. Only 15 faculty members in the McCormick School of Engineering and Applied Sciences are appointed to this professorship at any time. He is only the second faculty member from the IEMS Department to have this honor, and the first in the last 12 years. Previously he held the Bette and Neison Harris Chair of Teaching Excellence.

This honor recognizes Daskin's all-round excellence in research and teaching, and the outstanding leadership that he has shown as the Chair of the IEMS Department from 1995 to 2001, and as the president of INFORMS (the Institute for Operations Research and the Management Sciences) in 2006.

Daskin's research focuses on the application and development of operations research techniques for the analysis of transportation, supply chain, and manufacturing problems. He is the author of over 50 refereed publications as well as a text entitled, *Network and Discrete Location: Models, Algorithms, and Applications* (John Wiley, 1995).

Daskin is the recipient of the Fred C. Crane Award for Distinguished Service from the Institute of Industrial Engineers (2005), the Fellow Award from both INFORMS (2004) and IIE (2006), and the IIE Technical Innovation Award (2001). He is a past editor-in-chief of both *IIE Transaction and Transportation Science.*

Hurter Academic Excellence Awards

Hurter Academic Excellence Awards were initiated in 2002 to honor Prof. Arthur Hurter, who retired in 2001 after 38 years of service on the IEMS faculty. He was the department chair for 20 years from 1969 to 1989. The awards are funded from an endowment established by donations from ex-students and colleagues of Prof. Hurter. Two awards are given each year – best graduating senior and best first year graduate student. The criteria for the award include, besides academic performance, independent project work and leadership. Each award consists of a certificate and a check for $500.

This year, there were two winners in each award category. For the best graduating senior, the award was given to Brad Zakrzewski and Brad Schwartz. For the best first year graduate student, the award was given to Ming Lu and Michael Huang.

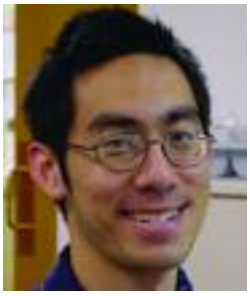
In addition, for the last two years, we have been giving a $100 cash award from the same endowment to the best graduate teaching assistant. This year's award was won by Shane Drew.

Congratulations to all award winners!

Brad Zakrzewski

Brad Schwartz

Ming Lu



Michael Huang

Shane Drew

IEMS Undergraduate Studies Healthcare in the US and Abroad

Stephanie Gravenor, an IEMS junior from Tennessee, first became interested in healthcare information technology (IT) as a quality control engineering intern at Memphis LeBonheur Pediatric Hospital in the summer of 2006. During her internship, the hospital switched from paper records to electronic records, as part of a statewide health IT initiative. After experiencing the implementation process first-hand, Stephanie was curious to learn more about worldwide efforts to imbed IT into healthcare. In particular, Stephanie wanted to focus on the emergence of electronic health records (EHR), both in the United States and abroad. As a French minor, she began looking for opportunities to combine her background in industrial engineering and management sciences with her language skills. In fall 2006, Stephanie enrolled in a study abroad program in France and interned at the French organization responsible for development and deployment of the national EHR model. Unlike the U.S., France has mandated EHR use and provided funding sources for nationwide implementation, to be fully deployed by summer 2007. During her internship, Stephanie prepared work group sessions for the project engineering team and, in collaboration with the chief medical advisor, created a rights-of-access matrix that was appended to the constitutional amendment defining the content of the French EHR model. She found that challenges related to standardization and interoperability are common threads that hinder EHR adoption in all countries. Further, Stephanie was surprised that scholars have not yet identified these barriers in a concerted or collaborative manner.

Stephanie Gravenor and Gordon Hazen

Back at Northwestern, Stephanie is continuing this research with Professor Gordon Hazen in the IEMS department. Her research project aims to evaluate the implementation strategies and key benefits of high-impact EHR systems in order to assess the benefits that an organization should hope to expect from the implementation of an EHR as well as identify the benefits that should be engineered through the design, build, test, and implementation process. Stephanie began her initial research in spring 2007 with a focused study at Evanston Northwestern Healthcare (ENH). In the fall, she plans to expand the scope of her research to a national level to include healthcare organizations across the US that have achieved excellence in the implementation of EHR systems.

Stephanie has recently been awarded an Undergraduate Research Grant (URG) fellowship and will return to Europe this summer for the deployment of the French EHR model and to study key aspects of the UK EHR system. She believes that EHR architects in the U.S. would benefit from learning about the different French/UK approaches, their deployment experiences, as well as best practices.

Distinguished Alumnus Awards

We are very proud of the achievements of our alumni. To recognize and honor our most distinguished alumni, we established an award to be given annually starting in 2002. The award was presented to Joe Girardi in 2006 and to George Nemhauser in 2007. Both award ceremonies took place during the past year.

Joe Girardi graduated with a BSIE degree in 1986 and then began his highly successful baseball career as a catcher with the Chicago Cubs. He later played for the Colorado Rockies, St. Louis Cardinals and New York Yankees, ending his career with the Cubs. He was a member of three World Series Championship squads in New York, and played in a total of six postseasons. He was an All-Star in 2000. He retired as a player in 2004. In his very first season as the Manager of the Florida Marlins, he won the National League Manager of the Year Award in 2006. Currently, he is a broadcaster with the YES network. Joe's award ceremony took place on February 17, 2007 and was a media event with several local TV networks attending. Joe spoke about his student days, his baseball career and the importance of nurturing relationships both in personal and professional lives. There was a lively Q & A session at the end of the speech, followed by media interviews.

Joe Girardi

George Nemhauser

George Nemhauser received his doctorate degree from the IEMS Department in 1961. After teaching at Johns Hopkins University and Cornell University (where he was also the Director of School of OR & IE), he moved to Georgia Tech in 1983 where he is currently the A. Russell Chandler and Institute Professor in the School of Industrial & Systems Engineering. His methodological research focus is on discrete optimization and large-scale mixed-integer programming problems. He works on many applications, especially crew and fleet scheduling problems in the airline industry and professional sports season scheduling, which was the topic of his speech.

George has been a recipient of many honors including membership in the National Academy of Engineering, the Kimball Medal, the Lanchester Prize (twice awarded), Morse Lecturer of ORSA and fellow of INFORMS. He has served various governmental agencies, including the NSF, NIST, and NRC. The award ceremony took place at the annual meeting of the Department's Advisory Board (of which George is a member) on May 5, 2007.

Letter from the Chair

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Smilowitz received tenure and was promoted to associate professor (she and her husband, David Corr, became proud parents of a son, Eli, born on April 9, 2007), Prof. Jeremy Staum was promoted to untenured associate professor, Prof. Bruce Ankenman was appointed director of the MEM program (taking over from Prof. Barry Nelson) and also of the Institute for Design Engineering & Analysis (IDEA), and Prof. Tito Homem-de-Mello was appointed Graduate Program Chair (taking over from Prof. Gordon Hazen).

We are partnering in a new undergraduate certificate program in Managerial Analytics that will be launched by Kellogg in Fall'08. Many of our sophomores are likely to apply for this program. Kellogg started the Financial Economics certificate program this Fall. The first class admitted 46 students of whom 8 are our sophomores double majoring in economics.

While these new exciting developments have been taking place, our undergraduate, graduate and MEM programs continue their robust health. Our senior graduating class had 67 students (a close second to Biomedical's graduating class of 70) of whom 57 (85%) had job offers at graduation time; compare this with 51% for the rest of McCormick, and you will see why IE is such a popular major with students. The number of PhD graduates this year was 11, all of whom were well-placed. We welcomed a class of 21 first year graduate students (16 PhD + 5 MS) which is the largest matriculating class in the department's history.

The department will be completing 50 years in 2008 and we plan to celebrate the Golden Anniversary at Homecoming on October 17 and 18, 2008. Please put these dates on your calendar and plan to attend. Further details about the program will be announced in due course.

The department plans to celebrate the Golden Anniversary at Homecoming on October 17 and 18, 2008

Please feel free to contact me by phone (847-491-3577) or by e-mail (ajit@iems.northwestern.edu) if you have any questions, suggestions or comments. Do visit our website (www.iems.northwestern.edu) to get the latest updates.

New Faculty

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what are the consequences of that?" This type of research necessitates interdisciplinary work and collaboration between departments, which was a primary decider for him in coming to Northwestern. Besides teaching courses in IEMS which will be cross-listed with the School of Communication, he will also teach a course in the Kellogg-McCormick joint MMM Program. His vision is "to make this university a showcase program on the interdisciplinary study of the science of networks" and adds that "IEMS is an outstanding department to host that showcase."

Prof. Contractor earned his Bachelor's degree in Electrical Engineering from the Indian Institute of Technology (Chennai), as well as a Master's and a Ph.D. degree in Communication from the University of Southern California. He has published or presented over 250 research papers throughout his professional career, receiving top paper awards from both the International Communication Association and the National Communication Association. His book titled "Theories of Communication Networks" (co-authored with Professor Peter Monge and published by Oxford University Press) received the 2003 Book of the Year award from the Organizational Communication Division of the National Communication Association. Prof. Contractor has been a consultant to several companies including Boeing, Charles Schwab, and Procter & Gamble.

Prof. Diego Klabjan joins the IEMS Department also from the University of Illinois at Urbana-Champaign, where he was an associate professor in the Department of Civil and Environmental Engineering. Prof. Klabjan completed his undergraduate work in Applied Mathematics at the University of Ljubljana, Slovenia, and earned his Ph.D. in Industrial Engineering from Georgia Institute of Technology. His main research areas are integer programming, large-scale optimization, dynamic programming, and high performance (parallel) computing with applications to airline scheduling, supply chain management, logistics, and radio frequency identification.

Prof. Klabjan bills himself as "always striving to go into new exciting areas." A prime example of this ambition is evident through his research with Prof. David Simchi-Levi of M.I.T. on interplanetary supply-chain management and logistics architecture, which was recently featured in an online article at Forbes.com. The team is developing a tool, called SpaceNet, with funding from NASA. SpaceNet is a decision support system to help NASA in future lunar and Mars missions. Prof. Klabjan has been a consultant to United Airlines, American Airlines, Sabre Holdings, FedEx Express, NASA, and SembCorp Logistics. At Northwestern, Prof. Klabjan hopes "to engage in many more collaborations with faculty, not only in the IEMS department, but across the university."

Prof. Paul Leonardi recently earned his Ph.D. in Management Science and Engineering, Center for Work, Technology and Organization at Stanford University. Earlier, he earned a Bachelor's degree in Communication and Spanish Honors from Saint Mary's College of California and a Master's degree in Organizational Communication from the University of Colorado at Boulder. Prof. Leonardi's research interests include the co-evolution of technological and organizational change, international technology management, management of technical work, and organizational communication.

Like Prof. Contractor, Leonardi cites the "interdisciplinary of the university" as the major selling point in choosing Northwestern. Leonardi bills himself as a hybrid; part social scientist, part engineer, and believes that at Northwestern he will be able to successfully bring behavioral science-type work into engineering. He expects his students to gain real-world knowledge in the classroom, stating that he desires to "plant the seed on how to navigate yourself in an organization as a junior employee, and then also, as you move up the ranks, how you can influence the organization to really better the engineering workforce."

We are delighted to have these three outstanding faculty join us and look forward to their contributions in helping the Department move up to the next level.

New faculty foster cross-linking with School of Communication

PhD Class of 2007

Name	Advisor	Employer
Frank E. Curtis	Jorge Nocedal	New York University
Long Hei	Jorge Nocedal	Chicago Trading Company
Xuefeng Jiang	John R. Birge	Standard & Poor's
Bora Kolfal	Seyed Iravani	University of Alberta
Pavlo Kovalov	Vadim Linetsky	Quantitative Risk Management, Inc
Vadim Lesnevski	Barry L. Nelson Jeremy Staum	Royal Bank of Scotland
Zhen Liu	John R. Birge	University of Missouri-Rolla
Dingxi Qiu	Ajit Tamhane Bruce Ankenman	University of Miami
Kristin M. Sahyouni	Mark S. Daskin R. Canan Savaskan	Walt Disney Company
Reuben Thomas	Sanjay Mehrotra	National Institute of Environmental Health Sciences
Gigi Yuen-Reed	Wallace J. Hopp Seyed Iravani	IBM

Faculty Research Grants and Projects

Faculty	Project Title	Funding Agency
Ankenman	Clothes Care Research Center Proposal to GE Appliance:	GE
Ankenman	CCRC Investigation of Clothes Care with Reduced Energy	GE
Apley	CAREER: A Methodology to Systematically Characterize and Diagnose Manufacturing Variation with In-Process Measurement Data	NSF
Contractor	Collaborative Research: Social Networking Tools to Enable Collaboration in the Tobacco Surveillance, Epidemiology, and Evaluation Network (TSEEN)	NSF
Contractor	Collaborative Research: Social Networking Tools to Enable Collaboration in the Tobacco Surveillance, Epidemiology, and Evaluation Network (TSEEN—REU Supplement)	NSF
Contractor	Collaborative Research: DHB Virtual Worlds: An exploratorium for Theorizing and Modeling the Dynamics of Group Behavior	NSF
Daskin/Chopra	Risk Management in Supply Chain Design and Operations	NSF
Fourer	Next Generation Servers for Optimization as an Internet Resource	NSF
Fourer	Toolkit for Advanced Optimization and Network-Enabled Optimizations Systems	DOE
Hazen	Collaborative Research: Adding Extrinsic Goals to the QALY Model	NSF
Homem-de-Mello	Collaborative Research: Model Accuracy and Learning in Revenue Management and Dynamic Pricing	NSF
Homem-de-Mello/ Mehrotra	Optimization Algorithms for Problems with Stochastic Dominance Constraints	NSF
Homem-de-Mello/ Daskin/Smilowitz	Yield Management Opportunities at Carry Transit	Superior Bulk Logistics
Hopp/Iravani	GOALI: Principles of White Collar Workforce Management	NSF
Hopp	Integrated Product and Supply Chain Design	NSF
Hopp/Nelson	Strategic Decision Making Support Over the Manufacturing Life Cycle	GM
Iravani	Collaborative Research: A Design Methodology for Operational Flexibility	NSF
Iravani/Smilowitz	Design and Control Principles of Non-Profit Supply Chains	NSF
Klabjan	Approximate Dynamic Programming in Complex Multi-Echelon Inventory and Production Systems	NSF
Linetsky	High-Performance Computational Methods for Continuous-Time Markov Processes in Financial Engineering	NSF
Linetsky	GOALI: Modeling and Managing Customer Default Risk in Manufacturing	NSF
Mehrotra	Methods for Solving Mixed Integer Programs Using Adjoint Lattices	NSF

Faculty Research Grants and Projects

Faculty	Project Title	Funding Agency
Mehrotra	Mixed Integer Programming Using Lattices	ONR
Nelson	Collaborative Research: QNATS – The Queuing Network Approximator for Time-Dependent System	NSF
Nelson/Ankenman	Collaborative Research: Multi-Product Cycle Time and Throughput Evaluation via Simulation on Demand	SRC
Nocedal	Active-Set and Interior Algorithms for Non-Linear Optimization	NSF
Nocedal	Parallel Algorithms for Nonlinear Optimization	Intel
Nocedal	Nonlinear Optimization and Applications	DOE
Smilowitz	CAREER: Strategies to Improve Goods Movement: Operational Choice in Routing	NSF
Smilowitz	Sloan Industries Fellowship	Sloan
Staum/Nelson	Simulating Coherent Risk Measures	NSF
Tamhane	Decision Rules for Multiple Endpoints in Clinical Trials	NIH
Tamhane	A Statistical Modeling Approach to Some Problems in Data Mining for Multivariate Binary Data	NSA

Michael Marasco

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leading the effort to launch NUvention, a revolutionary academic partnership that will foster entrepreneurship and innovation within the classroom and expand upon Northwestern University's excellence in interdisciplinary study.

NUvention's first class offering is titled Medical Innovation (IEMS 495) – a two-quarter class starting in fall 2007 involving students and faculty from four Northwestern schools: law, medicine, engineering, and business. Medical Innovation will focus on identifying unmet clinical needs, innovating novel medical technology, and delivering this innovation to the patient bedside. Students will experience the entire innovation/business life cycle from ideation to prototyping and business plan development. IEMS Advisory Board Member Ed Voboril is serving as chair of NUvention.

As part of his IEMS Senior Design class, Michael is partnering with the Global Health Initiative of the Biomedical Engineering Department to develop new projects. These projects would involve IEMS student teams spending the spring quarter in the ghettos near Capetown, South Africa to plan and assist in the challenges of healthcare delivery in rural areas.

Michael researches how established businesses can successfully foster new businesses through corporate venturing. He also focuses on the concept of "bootstrapping" – how to grow a company with little or no capital. He received his BS in Accountancy with high honors from DePaul University and an MBA from the Harvard Business School.

McCormick School Awards to IEMS Faculty

Professors Sanjay Mehrotra and Barry Nelson received the McCormick Advisor of the Year and the Teacher of the Year Awards, respectively. These awards are given based on student nominations. Prof. Nelson had previously won the Teacher of the Year Award in 1997-98. Prof. Ajit Tamhane received the McCormick Excellence Award given to selected faculty every year.


Barry Nelson


Sanjay Mehrotra

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