A Rich Academic History

In our last issue we highlighted several faculty members who have been with IOE since the early days of the Department. In this issue we continue to remember the people who have helped shape the IOE Department as we look back on the careers of Katta Murty, Don Chaffin and Stephen Pollock. These will be familiar names to most readers. In their time at the University of Michigan, all three have had a significant impact on the Department and the field of Industrial and Operations Engineering.

DON CHAFFIN

Don Chaffin, the R.G. Snyder Distinguished University Professor Emeritus of Industrial Engineering and Biomedical Engineering, began his career at Michigan in 1964 as a graduate student under the supervision of Professor Hancock. His undergraduate experience at GMI (now Kettering University) and his GM plant experiences convinced him that tools and equipment that workers were being provided needed to be improved. He often states that the distinguished research oriented faculty in OR methods (e.g. Merrill Flood, Bob Thrall, and Ralph Disney), Production Planning and Scheduling (e.g. Herb Galliher and Dick Wilson), Statistical Process Control (e.g. Hugh Bradley), and other noteworthy instructors, like Bert Steffy, Clyde Johnson, and Jim Gage, in addition...
to Walt Hancock’s leadership in the area of human performance, were important factors in coming to Michigan. In addition, there were a number of outstanding faculty from other departments that made his interdepartmental studies possible: Paul Fitts and his student at the time, Dick Pew, from the Department of Psychology, Wilfrid T. Dempster in the Department of Anatomy, John Faulkner in Physical Education, and Harold Magnuson, an Occupational Physician in the Department of Industrial Health in the School of Public Health. These people all contributed to his thesis research which focused on modeling the biomechanical and physiological effects of manual exertions in industry.

Following his graduation in 1967 and a one year appointment as an Assistant Professor in the Department of Physical Medicine and Rehabilitation at the University of Kansas Medical Center, Professor Chaffin returned to Michigan as an Assistant Professor in Industrial Engineering. His expertise in occupational biomechanics and physiology was complemented by the subsequent additions of Professor James Miller in safety systems engineering, Professor Gary Herrin in behavioral statistics, and Professor Gary Langolf in perceptual and motor skills. Professor Chaffin led this team in competing successfully for the first training grant in occupational safety engineering from the National Institute for Occupational Safety and Health in 1972. This program has provided funding for several hundred MS and PhD students in IOE who wish to specialize in occupational safety and ergonomics. This program continues to this day, now under the supervision of Professor Monroe Keyserling.


Professor Chaffin used a sabbatical in 1983 to produce the first edition of his popular textbook “Occupational Biomechanics” with help from orthopedist and co-author Gunnar Andersson, and his wife and illustrator Barbara. Now with the help of co-author Bernard Martin, the book is in its fourth edition. Many alums will recall this book from their IOE 534 Occupational Biomechanics class.

The Human Performance Laboratory was re-named the Center for Ergonomics in 1980. Professor Gary Herrin served as the first Center Director until Professor Chaffin ended his term as Department Chair and succeeded him in 1982. Professor Chaffin continued to
serve as the Center Director until 1998. The Center for Ergonomics has and continues to enable investigators from IOE and other departments and schools to leverage their intellectual and physical resources to study ergonomics, safety and health problems in a variety of organizations. The Center maintains machine and electronics shops, a full time technician and one to two research engineers. Over the years, James Foulke and Charles Woolley have helped many students complete their research. In addition, the Center conducts a number of ergonomics short courses on and off campus each year with the help of Randy Rabourn, the director of continuing education.

In 1998, with the aid of several outstanding graduate students and faculty colleagues, including Professors Julian Faraway (then the Chair of the UM Department of Statistics), Matthew Reed (UM Transportation Research Institute) and Bernard Martin (IOE Department), Professor Chaffin founded the Human Motion Simulation Laboratory to perform studies that are serving now as the basis for commercial digital human models of people performing a variety of industrial tasks and in driving vehicles. The data from their studies are shared with 12 other universities and national research laboratories. The HUMOSIM Laboratory has contributed key elements to the popular UM ergonomics tool: “3D Static Strength Prediction Program”, and to “Jack”, a human animation tool used in Siemens CAD environments.

Professor Chaffin has acquired many honors and awards for his scholarly accomplishments, including being elected to Fellow status in seven professional and scientific organizations. He remains a member of the National Academy of Engineering where he is now Chair of the Industrial, Manufacturing and Operations Engineering Section. Though he retired in 2007 after 40 years as a faculty member and mentor to 40 plus PhD students, he remains professionally active, and can be found in his IOE office most days. In 2010 he led the organization of an NSF Workshop and National Academy of Engineering Symposium on modeling and simulation methods to improve manufacturing systems. He also continues to lead in the formation of an engineering emeritus faculty organization. In his spare time he continues to enjoy boating on the Great Lakes and playing drums in the percussion section of the Washtenaw Community Concert Band.

Katta Murty

Professor Katta Murty began his career at Michigan in Fall 1968. He attributes his interest in optimization continued on page #13
Welcome to IOE News, our newsletter for alumni and friends of the Department of Industrial and Operations Engineering. In this issue we continue our feature on the rich history of the Industrial and Operations Engineering Department. In our last issue, you saw IOE history through the eyes of Richard Wilson, Walton Hancock and Seth Bonder. This time we feature memories from Don Chaffin, Katta Murty, and Stephen Pollock, professors I’m sure many of you remember from your time here in IOE.

I’m pleased to say that my first full academic year in IOE has been a great one. What you’ll see in the pages of this newsletter are just some of the accomplishments of our students, faculty, and alumni. One constant in IOE is that everyone is very productive and incredibly accomplished!

In this issue you’ll meet a student entrepreneur and a student athlete and you’ll see the many impressive recognitions and awards members of our IOE community have received. I’m proud to note that one of our newest faculty members, Professor of Practice Larry Burns, was elected to the National Academy of Engineering. We’ll also introduce you to 2010 Alumni Award Winner, Marlin Thomas, and our newest faculty member, Jim Bagian. I anticipate having many more new faculty members to introduce in our Fall 2011 issue.

As always, this is your newsletter and we enjoy hearing from you. We hope to highlight more alumni news in upcoming newsletters and we’ve also started an Alumni Spotlight feature in the newsletter and on our website.

You can see a preview of our Alumni Spotlights on page 11 of this issue. We ask that you let us know if you’d like to be highlighted in our Spotlight in the future. I’d also love to hear what you’ve been up to, both professionally and personally, so that we can highlight some of your accomplishments in future issues. Please send your comments, suggestions, news items, etc. to IOENewsletter@umich.edu.

I have enjoyed meeting many of you this past year. Whenever you are on campus, our doors are always open to you. Please drop by to introduce yourself or catch up!

Go Blue!
Mark S. Daskin
Faculty & Staff Announcements

IOE Instructor Robert Bordley will be installed as a Fellow of the American Statistical Association at the AmStat conference in August 2011. Professor Bordley was nominated by other AMA fellows in recognition of his outstanding contributions to statistics.

Candy Ellis, IOE Department Administrator, was selected for a College of Engineering Excellence in Staff Service Award. The award recognizes sustained excellence in staff who have made significant contributions or possess special qualities and attributes that foster teamwork and achievement.

Professor Jack Hu was elected chair of the Scientific and Technical Committee for Assembly Technologies.

Chuck Woolley, Senior Research Lab Specialist and Lecturer in IOE, celebrated 30 years with the department this year.

Yili Liu, Arthur F. Thurnau Professor, now holds two World Records. He is the first person to visit solo all 194 United Nation member countries and he also holds the Guinness World Record for the fastest time to visit all 194 United Nations member countries.

Professors Judy Jin and Nadine Sarter were both promoted to Full Professor effective September 1, 2011.

Professor Amy Cohn was the recipient of an Arthur F. Thurnau Professorship in recognition of her excellence in teaching. This is one of the highest awards that the University of Michigan has for teaching.

Professor Jack Hu was awarded Best Paper at the International Conference on Frontiers of Design and Manufacturing. The paper, “Sequential Monitoring of Surface Spatial Variation in Automotive Machining Processes Based on High Definition Metrology,” was co-authored with IOE PhD student Saumuy Suriano and ME post doc Hui Wang.

Professor Edwin Romeijn won the 2011 IOE Department Award. The award recognizes a high impact accomplishment in a meritorious area benefiting the Department and College.
Mark Daskin, Clyde W. Johnson Collegiate Professor and Chair of the IOE Department, won the Institute of Industrial Engineers/Joint Publishers Book-of-the-Year Award for his book Service Science.

Professor Amy Cohn has been awarded a grant from Southwest Airlines to conduct research with her students on how to improve airline scheduling. Specifically, the team is investigating the variability of flight block time, how block time can be better predicted, and how the inevitable variability in block time can be accounted for operationally. The team is comprised of IOE doctoral student Nattavut Yampikulsakul and undergraduates Gordon Belcher, Luyao Chen, Ryan Chen, Zhuoxin Chen, Matthew Friedman, Brian Harris, Chenchen Lu, Katherine Lu, Andrew Schlesinger, and Daniel Weinblatt.

Student & Alumni Announcements

Chris Best was a runner up in the Spring 2011 Mobile Apps Challenge for his iPod app for the 3DSSPP Ergonomics biomechanical analysis tool. The Spring 2011 Mobile Apps Challenge promoted entrepreneurial thinking and encouraged the University of Michigan community to develop innovative mobile applications.

Soroush Saghaian was awarded Second Prize, Best Paper Award from the College of Healthcare Operations Management of the Production and Operations Management Society for the paper titled “Patient Streaming as a Mechanism for Improving Responsiveness in Emergency Departments” by Soroush Saghaian, Wally Hopp, Mark Van Oyen, Jeff Desmond, and Steven Kronick. Soroush and his coauthors also won the 2010 Pierskalla Award for the Best Paper in Healthcare at the 2010 INFORMS conference for the same paper.

Jonathan Helm won the 2011 Katta Murty Prize for Best Research Paper on Optimization for his paper titled “Design and Optimization Methods for Elective Hospital Admissions.”

IOE PhD candidate Fei Peng was a Technical Session Award winner in the 2010 Graduate Engineering Symposium for his submission, “Treatment plan optimization for volumetric modulated arc therapy (VMAT).”

Kamran Paynabar won the 2010 Richard C. Wilson prize for his paper titled “Characterization of Nonlinear Profiles Variations using Mixed-Effect Models and Wavelets.” Hoda Parvin was the 2011 winner for her paper titled “Dynamic Assignment Policies in ‘N’ Network with Impatient Customers and Finite Queue Capacity.” The prize is given to the best student paper dealing with any aspect of manufacturing systems.
Marcial Lapp was awarded the Alpha Pi Mu Instructor of the Year Award for 2010/2011 for excellence as a graduate student instructor.

Jonathan Helm was awarded First Prize, Best Paper from the College of Healthcare Operations Management of the Production and Operations Management Society (POMS) for the paper “Design and Optimization Methods for Elective Hospital Admissions” by Jonathan Helm and Mark Van Oyen.

Kathryn Tippey and Denny Yu were both awarded National Science Foundation Graduate Fellowships in 2011. The fellowships provide three years of support for the graduate education of individuals who have demonstrated their potential for significant achievements in science and engineering research.

Fei Peng was awarded the 2010 Seth Bonder Fellowship, awarded on a competitive basis to a superior IOE graduate student who wishes to study and do research in the field of applied operations research.

Irina Dolinskaya, a PhD alumni, won the Transportation Science Dissertation Prize at the 2010 INFORMS meeting.

Brian Kostukovsky received the Fall 2010 Andrew S. Crawford Award for Entrepreneurship Excellence and George Schick was honored with the award in Winter 2011. This award is named after the late Professor Andy Crawford, in honor of his entrepreneurial spirit and interest in imparting business skills to Michigan engineers. Brian’s project was a website that helped unemployed people connect with short term work opportunities by doing small jobs for people in their communities. George’s project was a website that allowed people to donate unused tickets to benefit needy children.

Three IOE Students were on winning and honorable mention teams in Tauber Spotlight! Competition 2010. Thirty-one student teams presented the results of their 14-week summer projects and competed for over $30,000 in scholarship awards. Jonathan Loh was on the Second Place team, W.W. Grainger, Inc.: “Labeling System Redesign.” Ben Don was on the Third Place team, BorgWarner, Inc.: “Packaging & Corrosion Protection Analysis of Turbo Charger Housings,” and Tony Zhang’s team, Federal-Mogul: “Driving Savings by Implementing a Cost Modeling Approach within Purchasing at the Global Aftermarket Division of...
Federal-Mogul Corporation, received an honorable mention.

Justin Young was awarded an American Society of Safety Engineers Foundation Liberty Mutual Research Fellowship. The fellowship supports outstanding students doing occupational safety and health research.

Swapnaa Jayaraman received the 2010-2011 Barbour Scholarship. The scholarship was established at the bequest of Levi L. Barbour for women of the highest academic and professional caliber from the area formerly known as the Orient to study modern science, medicine, mathematics and other academic disciplines and professions critical to the development of their native lands.

The University of Michigan student chapter of Alpha Pi Mu earned national honors in 2010 as "Outstanding Chapter" for Region IV. APM is the only nationally recognized Industrial and Operations Engineering Honor Society.

Ben Don and Jonathan Helm were awarded Vivian Shapiro/John Malik/Jean Forrest Awards for 2010.

Timothy Rose was the winner of the 2011 Joel and Lorraine Brown Graduate Student Instructor Award in recognition of his outstanding performance as a GSI.

Veronica Hicks is on the Winter 2011 Academic All-Big Ten Team for women’s basketball and Dan Medwed is on the team for men’s swimming and diving. IOE students who made the Spring 2011 Academic All-Big Ten Team are Miguel Echavarria for men’s golf, Kaitlyn Peale for women’s track and field, and Natalie Naruns for water polo. Winter 2011 awardee Veronica Hicks is profiled on page 9 of this issue.

The IOE Department is considering moving some or all of our newsletter distribution to an electronic PDF version as opposed to print. We’d love to hear your thoughts on this possible change at IOENewsletter@umich.edu.

You can make sure your e-mail address and other personal information is updated in our files by going to http://www.engin.umich.edu/alumni/info/infoupdate.html
IOE Student Shines on Basketball Court and in the Classroom

Veronica Hicks always wanted to play basketball in the Big Ten. She got her wish when she was recruited by the University of Michigan. She chose Michigan because she was impressed with both its academic and athletic reputation. A life-long love of math and science led her to choose Industrial and Operations Engineering as a major.

In her time at the University of Michigan, Veronica has been recognized multiple times for her academic and athletic achievements, earning recognitions such as Most Valuable Player and Best Defensive Player as well as receiving three Academic All-Big Ten awards. Of her many awards for both athletics and academics, Veronica says, “It’s great when you know you’ve been doing the right stuff, that you’ve been good in the classroom while also attending to athletic responsibilities.” She adds, “I think my parents were even more proud than I was.”

Her parents are proud with good reason. It isn’t easy juggling a demanding academic and athletic schedule but Veronica has done so expertly. She had to take courses during the Spring/Summer term every year but, even with her hectic schedule, she managed to stay on track to graduate in four years. While she says it was difficult to schedule classes around practice, not to mention finding time to eat, sleep, and do homework, she says the University and her professors were extremely helpful and willing to be flexible with things like scheduling exam times for her when exams happened while she was on the road for basketball.

That flexibility allowed Veronica to truly engage in her classes. She especially enjoyed gaining work experience in her Six Sigma class. Students in the course had the chance to tackle real-life problems while working with groups like the Ann Arbor Housing Commission and Ann Arbor Planning and Development Services.

She names IOE 265 with Professor Gary Herrin as another of her favorite courses. Veronica remembers that one day before the start of a lecture, Professor Herrin held up a page from The Michigan Daily with a big picture of Veronica playing basketball on it and said proudly, “She’s right here in our class.” She says, “It was special to know my engineering classmates and professors recognized me as an athlete.”

Despite the many demands on her time, Veronica took time to enjoy Ann Arbor. Some of her favorite activities in Ann Arbor included movies, sporting events, church activities, movies, and the Ann Arbor Film Festival.

Veronica graduated from Industrial and Operations Engineering this April. “I’ve weathered the storm,” she says. Her next step is to spend some time playing professional basketball overseas, she hopes in Spain. After that, she’s considering pursuing an M.B.A.
IOE Entrepreneur Revolutionizes the Baby Clothes Market

Industrial and Operations Engineering senior Allen Kim says, “Making other people’s lives better from what I create has always been my passion.” That passion may be why, though he’s not yet graduated from the University of Michigan, he’s already having success as an entrepreneur. Late last year he was named College Entrepreneur of the Year by Entrepreneur Magazine.

Allen is the co-founder of Bebarang (http://bebarang.com/), a service he describes as “like Netflix for baby clothes.” He describes himself as someone who likes to be fashionable but realizes that clothes, especially high end brands, can be expensive. A little over a year ago, he started to think about how nice it would be to be able to rent clothes and decided baby clothes specifically would be the perfect market for such a service.

He began talking to mothers online and in coffee shops. It quickly became clear that they were enthusiastic about his idea. “As soon as I told them about this idea of renting out baby clothes, I could see their eyes opening, being kind of ecstatic,” he says.

Then he went on a spring break trip with the Center for Entrepreneurship where he was able to present his idea to a group of business people and entrepreneurs. They encouraged him to pursue his idea saying someone else would run with it if he didn’t. That’s also where he met Bebarang co-founder, Luis Calderon.

That summer, Allen had the choice to take a paid Samsung internship in Korea or to stay in Ann Arbor and work at TechArb, the University’s student business incubator, and pay to try to start his business. He chose Bebarang. “I thought, if I don’t take advantage of this opportunity now, this may never come again,” he says.

So far, it looks like that bet has paid off. When the Bebarang prototype launched last August, hundreds of people signed up even without Allen paying money to market the site. Since then Allen and Luis have been testing the site and engaging with customers to solicit feedback. They are now in the position to scale the business to a much larger audience and hope to open the site up to 1,000 plus customers this summer.

Allen has found the IOE, marketing and finance aspects of running his business very engaging and recognizes that the University of Michigan, with its wealth of resources and opportunities for collaboration across fields of study, was uniquely suited to support him in this project. He says he’s extremely grateful for TechArb and MPowered. He also appreciates IOE professors Mark Daskin, Luis Garcia Guzman, Yavuz Bozer and Patrick Hammett as well as IOE PhD student Soroush Saghaian and Business School Professor Wallace Hopp. He says their courses and advice helped him as he developed his business.

This summer Allen and his business partner were accepted into NYC SeedStart, a business incubator program designed to provide seed funding to technology companies to build a product and launch their company. They’re working twelve hour days seven days a week on Bebarang.

When asked about his plans for the future, Allen says he’d like to take Bebarang to the international market and perhaps address more areas of parenting like maternity clothes and children’s toys. He can see himself becoming a “serial entrepreneur.” “I like to jump on problems and work to make this world a better place.”

Allen Kim
Professor of Practice James Bagian Joins IOE Department

This year the IOE Department welcomed Professor James Bagian as our newest professor of practice. He also holds an appointment in the Medical School and is heading a new Center that will bring expertise in engineering and medicine together to solve problems in healthcare. Before coming to the University of Michigan, Dr. Bagian served as the first Director of the VA National Center for Patient Safety and the first Chief Patient Safety Officer for the Department of Veterans Affairs, where he developed numerous patient safety related tools and programs that are in use nationally and internationally.

Dr. Bagian has served as a NASA astronaut and is a veteran of two space flights, STS-29 in 1989 and STS-40 in 1991, serving as the lead Mission Specialist for the first SpaceLab Life Sciences mission (SLS-1). He served as an investigator for the Space Shuttle Challenger and Columbia accidents. He is also a Colonel in the U.S. Air Force Reserve and currently serves on the Trauma and Injury Subcommittee of the Defense Health Board for the Department of Defense.

Dr. Bagian was elected to the National Academy of Engineering in 2003. In 2010 he received the American Astronautical Society’s Melbourne W. Boynton Award for “outstanding contributions to the biomedical aspects of space flight.” He serves on a number of committees including IOM Committees on A Learning Healthcare System in America and Patient Safety

According to Dr. Bagian, the University of Michigan has some of the top engineering and top medical programs in the country, the center has “an all-star bench to recruit from.”

Although based at the University of Michigan, Professor Bagian stresses that the lessons learned at CHEPS will be broadly applicable. “There is no one who is not impacted in some way by healthcare,” he says. “Most of us and our families are recipients of healthcare at some point.” People working at and with the Center will have “the opportunity to have a huge impact locally and nationally.”

Professors Bagian and Cohn will also be teaching IOE 691, “Providing Better Healthcare through Systems Engineering.” The course will provide a forum for communication between healthcare and engineering. The goal is to help participants in the course to better understand not only the challenges that exist in healthcare but the talents that are available to solve those problems. Both the course and the new Center are unique and exciting collaborations between the engineering and healthcare fields that have the potential for great discovery and impact.
Alumni Awardee Marlin Thomas

Industrial and Operations Engineering’s 2010 Alumni Awardee was Dr. Marlin U. Thomas (PhD IOE ’71), Dean of the Graduate School of Engineering and Management at the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. In addition to participating in many of the Homecoming weekend activities, Dr. Thomas was able to spend time meeting with the IOE alumni board and a group of current students to discuss how students and alumni could help one another.

He also delivered a seminar to IOE students, faculty and alumni on Friday, October 15th of 2010. His talk was titled “Toward an Integrated Product Quality System.”

While warranties have been in existence as long as people have exchanged goods it has only been in relatively recent years that warranty issues have been included as major elements of product planning and quality improvement programs. Warranty decisions can be the manufacturer’s most significant cost considerations in product planning which include policy development, the allocation of warranty cost reserve funds, and maintenance and replacement decisions. The challenges are due not only to product failure characteristics but also to the risk and uncertainties in customer acceptance and perceptions.

In his seminar, Dr. Thomas looked at the evolution of product warranties relative to the role of customer influence and proposed a way forward based on an integrated product quality system paradigm. There is a rich literature on models and methods for dealing with warranty economic decisions but the real issue is how to improve product quality while reducing warranty costs. One way to accomplish this is through joint customer-manufacturer maintenance collaboration.

Dr. Thomas presented a proposed method for incorporating customer-cost variability sensitivity in design decisions for age-based replacement and maintenance strategies for warranted products. The method is based on giving some weighted consideration to the variation in cost along with the expected cost in formulating criterion functions for determining optimal design decisions. He also described an algorithm for generating extended warranty options based on upper bounds computations for warranty length and acceptable prices.

The talk was followed by a lively discussion between Dr. Thomas and the alumni, students, and faculty in attendance.
to the humble circumstances of his childhood. “Born and brought up in a poor family in India, Optimization (maximizing the benefits that can be derived from available limited resources) has been an integral part of my life from childhood.” He recalls Ann Arbor as a quiet university town of only 60,000 people at that time and the small number of faculty housed in part of a huge and very old building called “West Engineering” on Central Campus. All faculty members in the Department were male at that time — female faculty members would not appear in the Department for some time.

In the 1960s, the optimization courses were mostly cross-listed with the Math Department and taught by Professor Robert Thrall. Alan Spivey (Business School) and Gene Lawler (CICE program in ECE Department) occasionally taught some optimization courses cross-listed between Engineering and Business. Professor Thrall moved to Rice University in 1970, leaving Professor Murty as the sole faculty member in optimization in IOE. He quickly introduced several courses based on his experience at Berkeley: IOE 612 (network flows), IOE 614 (integer programming), IOE 611 (nonlinear programming). He also revised the content of the undergraduate course IOE 310. With the help of Professors Spivey and Lawler the Department was able to cover all the courses in the optimization curriculum in IOE at that time.

When Professor Murty joined IOE, there were only two prominent books on linear programming. Complaints from students that some important topics were not covered in the available books inspired Professor Murty to prepare a new textbook of his own. His first book appeared in 1974 and was received very well, and adopted widely around the world. He has now published a total of six books with the last being released at the end of 2009.

He takes care and pride that all of his books include examples illustrating applications, and for this reason each of them has 500 or more pages. It is likely that most of the readers of this newsletter have studied from one or more of Professor Murty’s books.

A good course in Linear Algebra (LA) is an essential prerequisite for entry level optimization. Professor Murty prepared his own textbook on computational and algorithmic LA in OR style and made it available on the IOE website. All the students in his courses download this book. (He mentioned that few people have responded to his pleas to support this effort.) He has subsequently installed additional textbooks on the Department’s website. Many people access these books every day.

Professor Murty recalls how there was only a single mainframe computer operated exclusively by people in the Computer Center during the late 60s and early 70s. Many of the older alums also will recall preparing stacks of punched cards that were then submitted to the Computer Center and how it could take a couple of days to get the results back. His research involved developing efficient algorithms for problems. He recalls how different his office was in those days with only a few piles of papers or books, a few stacks of punched cards, and no machines. He fondly recalls how Mohammad Partovi, one of his graduate students, used to take care of all his computing needs, including organizing his “precious treasure” of various stacks of punched cards.

Professor Murty feels that the Department has attracted a lot of highly motivated students from around the world, which continues...
today. He has served as chair or co-chair for 22 PhD dissertations, many of them dealing with theory. He is especially interested in the theory that underlies optimization and expresses deep concern that many of the recent students are fearful of theoretical math and proofs. While continuing to promote the need for theoretical optimization, Professor Murty has worked with many students on applied problems. Over the years, several companies like AT&T, Motorola and several container terminals in Asian ports, involved him and his PhD students in modeling and solving problems in their operations. He says that optimization techniques can and should be used much more widely for the benefit of society, but the sad thing for subjects like “Optimization for Decision Making” is that none of the decision makers expect to be held accountable later on for the decisions they make without using these optimization techniques.

As Professor Murty completed his final year as a regular IOE Professor, he was very proud of his PhD graduates who were spread around the world, and all seemed to be doing well. At least two have started their own companies. One student now in Saudi Arabia has attained the very high position of “Rector” (their term for President) of the most prominent university in the Middle-East, and a cabinet minister in the government of the country, another is the dean of a college of engineering in the USA, and a third is the chair of a department.

Stephen Pollock
Professor Stephen Pollock credits his interest in operations research to his PhD studies in physics at MIT, when he realized he was more interested in how data were analyzed and interpreted than in the mechanics of the cyclotron that was used to collect them. He goes on to say that it was after “severely struggling” through his physics coursework and examinations, he met (and eventually worked under) Philip M. Morse, an eminent physicist and one of the founders of the Operations Research Society of America.

Ultimately he was able to form a dissertation topic dealing with probabilistic sequential search. Ron Howard (the co-director of the newly formed Operations Research Center, and a soon-to-be leader in the OR sub-discipline of Decision Analysis) agreed to become his primary research advisor; Phil Morse chaired his committee. Herbert Galliher, one of Pollock’s favorite professors at MIT, preceded Pollock to Michigan in 1963. Pollock said that Galliher’s move to Michigan alerted him to the fact that there could be an intellectually stimulating life other than on the east coast.

After getting his doctorate, he joined the staff of Arthur D. Little, one of the first OR consulting companies. He then went to the US Naval Postgraduate School in Monterey, California. In 1969 Seth Bonder, who was then a Professor in what was Michigan’s Department of Industrial Engineering (and involved in a large military OR research program) recruited Pollock to Michigan. Bonder promised him that if he came to Michigan he could work on whatever OR problems he found interesting, and in particular those involving the public sector. Pollock recalls that, ironically, his interview talk was about the evaluation of information retrieval systems – a field in which he never worked again. He has great respect for and memories of his colleagues in those
early days: Herb Galliher’s seminal work on determining the best frequency, as a function of age, for breast cancer screening and pap smears; Clyde Johnson’s and Walt Hancock’s work on creating the new discipline of hospital systems engineering, and the entire faculty’s support for the links he forged with the Institute for Public Policy Studies. It shouldn’t be a surprise to those of you who know him that the rich intellectual atmosphere, the faculty and the students at Michigan trumped the charm, beauty and weather of Monterey. As Pollock summarizes his 40 years at Michigan: it was always interesting, challenging and rewarding and – he quickly adds – “also often just plain fun.”

The breadth of Pollock’s work is evidence of his strong intellect and belief in the power of mathematical modeling. He has a natural curiosity about all things and is a wonderful person to work with, making him an ideal collaborator. His co-authors from among the department’s faculty include Craig Kirkwood, John Birge, David Kelton, Izak Duenyas, Don Chaffin, Gary Herrin, Tony Woo, Walt Hancock and Marina Epelman. His published papers reflect his interests in a wide variety of problems, including: Energy R & D Planning; Characterizing Adversaries of Nuclear Materials Safeguards Systems; Optimization of Rural Police Patrol; Collusion in Bids for Metal Pipe and Road Salt; Sewage Plant Operations; Terrestrial Irradiation; Improving the efficiency of Diagnosing Diabetic Patients; Balancing Cost and Productivity of Hospital Units; The Influence of Early Infection in the Spread of HIV; Adaptive Radiotherapy Under Uncertainty; Muscle Fatigue in Cyclic Exertions; Coordinate Measurement and Determination of Circularity; Minimum Cost Pipe Routing in Naval Vessels; Determining Whether Body Dies or Assemblies Should be Made to Specifications; Testing of Motor Vehicle Emissions; Optimal Can Filling; Classification of Spot Welds; Machine Maintenance; Type Matching in Production Processes; Assignment of Swimmers to Events for High School Dual Meets; The Optimality of Having

Two Sexes; Golf Handicapping; and Sequential Outlier Rejection.

In the early 1970s, Bonder created “Concepts in Mathematical Modeling of Large Scale Systems,” a seminar course in which students were asked to develop models of poorly specified but real “operational situations.” The goal was not to create “solutions” to problems, but to understand the process by which the mathematical representation of these operational situations can be formulated, simplified, tested, exoposed, used, transferred, etc. Bonder and Pollock collaborated on the course for a few years, and after Bonder left to establish Vector Research Inc. Pollock assumed responsibility for it (which he claims to have jealously guarded for over three decades!). The course evolved into what is now called the “modeling studio” (IOE 640), which is currently offered by Professor Amy Cohn. Pride in this course (and its principles) prompts him to leave humility aside and brag that many students who took the course have written to say it was the most influential educational experience they had at Michigan, while colleagues throughout the country have adapted versions for use at their own institutions. Pollock even published a few papers describing the studio and its principles.

Professor Pollock’s wife, Tina, says that he has categorically “flunked” retirement. Consulting opportunities now allow him to use mathematical models to help inform decision makers dealing with important issues. These, along with serving on various committees (particularly for the National Research Council) have not only kept him busy, involved and challenged; they also remind him that solving once daunting “word problems” can actually be an enjoyable retirement activity, even though there is no laboratory in his backyard. Maybe, in his mid-70s, he is just “too young to retire.”
Thanks to Our Generous Donors!

These people gave gifts to the Department in 2010. We appreciate the support of our alumni!

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**Timothy P. Gerios Endowed Scholarship Fund**
Timothy P. Gerios

**Walton M. Hancock Scholarship**
Walton and Charlene Hancock
Congratulations to our Recent PhD Graduates!

Pierre-Yves Brunet, Fall 2010, *The Effect of Trade Credit on Operational Policies and on the Relationship Between Banks, Suppliers and Manufacturers*, Chairs: Volodymyr Babich and Jussi Keppo, employment: Credit Strategy/Risk Analytics Manager at Barclays

Thomas Ferris, Fall 2010, *Informative Vibrotactile Displays to Support Attention and Task Management in Anesthesiology*, Chair: Nadine Sarter, employment: Assistant Professor of Industrial and Systems Engineering, Texas A&M

Swapnaa Jayaraman, Winter 2011, *Supporting Monitoring and Interruption Management in Complex Domains through Graded Multimodal Notifications*, Chair: Nadine Sarter, employment: Research Associate/Lecturer in Psychological and Brain Sciences Department, Indiana University


Murray Pyle, Fall 2010, *Imitation in Large Complex Organizations: When Does Copying Become Learning?*, Chair: Jeffrey Liker, employment: Assistant Professor of Business and Managerial Science, Marywood University


How Do You Think Your IOE Education Prepared You For Where You Are Today?

Irina Dolinskaya, MS IOE 2006 and PhD IOE 2009
It most certainly gave me the technical background necessary to succeed in my career. But I must say it gave me so much more than that. The diverse student body, inter-departmental research projects and opportunities to get involved in various activities on campus provided me with a solid base to leave the University of Michigan ready to tackle the world.

Rich Power, MS IOE 1999
When I was in IOE, I took the Software option. That was perfect preparation for me because I have been working in Information Technology since graduation. IOE is excellent preparation for Information Technology because it prepares you to think about processes, optimization, visualization, human interaction with machines (software programs in my case), and organizational challenges.

See full alumni profiles on the web at: http://ioe.engin.umich.edu/alumni/
If you’d like to be profiled on the web or in an upcoming newsletter, please e-mail IOENewsletter@umich.edu.
IOE Undergraduate Students Celebrate Graduation

This year the department held, for the first time, a reception to honor graduating undergraduate students. On the day of graduation, students and their families were invited to come to the IOE building and celebrate with faculty, staff, and fellow graduates. Nearly three hundred people attended: about sixty graduates plus family members and IOE faculty and staff.

In addition to the opportunity to mingle with other members of the IOE community, attendees could also view posters from IOE 424 student design projects. Family members enjoyed seeing where their students had spent the past four years and meeting some of the faculty and staff who had supported them throughout their education.

The event was a great way to celebrate the achievements of our exceptional students and to send them off to what will surely be bright futures. Some graduates are heading off to graduate school while others are starting jobs at companies including Accenture, American Express, McKinsey, and Microsoft.

Congratulations, IOE graduates. We wish you all the best of luck!
How can you…

...make a difference for IOE students?

...keep IOE on the leading edge?

Your tax-deductible gift to IOE will provide opportunities for students and keep our program strong. Please designate your support to:

IOE SPECIAL GIFT FUND
Your gift enables us to develop programs that help to support student organizations, sponsor seminars and outside speakers, initiate student research efforts, pursue special recruiting programs, and many other activities to enrich the department.

Please use the form below to make your gift today or contact us at IOEAnnualGiving@umich.edu to discuss Department gift options.

IOE UNDERGRADUATE SCHOLARSHIP FUND
Your gift enables us to make awards to undergraduates who have financial need, are outstanding students, or have exemplified exceptional leadership and character.

IOE GRADUATE FELLOWSHIP FUND
Your gift enables us to make awards to graduate students based on financial need, outstanding scholarship, teaching and/or research.

Please designate your gift to IOE for:

- [ ] IOE Special Gift Fund (329870)
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- [ ] IOE Graduate Fellowship Fund* (570861)

(Undesignated gifts will be placed in the IOE Special Gift Fund)

Enclosed is my gift of:  
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