INDUSTRIAL AND SYSTEMS ENGINEERING

NEWSLETTER 2013

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SUPPORT

PROVIDING A STABLE FUTURE FOR TOMORROW'S LEADERS

LEHIGH UNIVERSITY | P.C. ROSSIN COLLEGE OF ENGINEERING AND APPLIED SCIENCE

Class of 2013 poses for a picture after the annual ISE Banquet in April.

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ISE Department Newsletter Fall 2013

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Dear Friends,

I would like to welcome you again to the 2013 edition of the ISE department's newsletter. I hope you had a relaxing summer and enjoyed some time off with your friends and family. The ISE department again had a very active year with lots of new developments that we are excited to share with you.

With the support of the department's students, faculty, and Advisory Council, the department has revamped our undergraduate program. The revised program will be called the Industrial and Systems Engineering. This program provides more flexibility and more course options to students.

The department strives to maintain academic excellence and our prestige across the country. I am privileged to report that the Enterprise Systems Center and the department were selected for the second year in a row as one of the three finalists of the UPS George D. Smith Prize at the Institute for Operations Research and the Management Sciences (INFORMS) Analytics Conference.

The UPS George D. Smith Prize is created in the spirit of strengthening ties between industry and the schools of higher education that graduate young practitioners of operations research. INFORMS, with the help of CPMS (The Practice Section of INFORMS), awards the prize to an academic department or program for effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics. The prize went to the Department of Operations Research of the Naval Postgraduate School this year; however, the ISE department can be extremely proud of this prestigious recognition.

During the past year, we have been taking a step back from our traditional busy schedule to focus on the ABET accreditation process. This has been an intensive year-and-a-half review of the entire engineering college. Associate Dean Greg Tonkay and Associate Chairman George Wilson have been working tirelessly to make sure that all undergraduate programs of the college and the department will gain the full six-year accreditation.

This edition of the newsletter is dedicated to the engagement, involvement, and generosity of our alumni and friends. I humbly ask you to please support the department. The new ISE Technology Renewal Fund will maintain our high caliber of education by providing the best facilities to our students and faculty for courses and research. More details can be found on page 12.

As you read through our newsletter, you will see that we continue to grow and work toward constant academic and research excellence. This August we welcome our new faculty Boris Defourny. You will also see that our communication specialist, Amanda Fabrizio, is moving on to a new and exciting opportunity. Please join me in thanking Amanda for her memorable contributions over the past few years.

Your support, suggestions, or just simple observations are critical for making informed decisions about our department. Please feel free to send me your memories, opinions, ideas, or anything else you may want to share with me.

I am looking forward to seeing and hearing from you soon.

All the best,

Tamás Terlaky

Restructuring the undergraduate majors

Department to merge the two undergraduate programs into

INDUSTRIAL AND SYSTEMS ENGINEERING

During the past year, the ISE department has been restructuring the two undergraduate majors. Since 2001, the department has been offering Industrial Engineering and Information & Systems Engineering to undergraduate students. Starting with the Fall 2013 semester, the department will now be offering an Industrial & Systems Engineering degree.

"The department decided to begin this process after seeing a decline in enrollment in the Information & Systems Engineering program," said Associate Chair George Wilson. "After discussing the idea of renewing the program with our students, Advisory Council, and faculty, we decided to begin the process of revamping the curriculum."

The revised program provides more flexibility and more course options to students. There will be a core curriculum of industrial engineering courses, and then students will get to decide on a track that will concentrate in specific areas. Currently, the concentrations include industrial engineering and information and systems engineering. In the future, other track options will hopefully expand to healthcare, operations research, and others.

"The two original programs will remain intact until 2016 for current students who decide not to switch over to the new program," said Wilson.

For more information about the revised program, please visit our website.

www.lehigh.edu/ise/programcourses_u.html.

Operations researchers win major national recognition

For the second year in a row, the Enterprise Systems Center (ESC) and the ISE department have received one of the top honors in the field of operations research.

ESC and ISE were recently selected as one of three finalists for the UPS George D. Smith Prize awarded by the Institute for Operations Research and the Management Sciences (INFORMS). The other two finalists were MIT and the Naval Postgraduate School.

Operations researchers use sophisticated analytical techniques to help organizations solve increasingly complex problems. The ESC has completed more than 1,000 research projects with 400 industry partners since it was established as a research center in the P.C. Rossin College of Engineering and Applied Science almost four decades ago. More than 3,000 graduate and undergraduate students have participated in these projects, working in interdisciplinary teams with faculty and industry mentors to help companies solve real-world operations problems.

Tamás Terlaky, chair of the ISE department, said the recognition from INFORMS reflects the department's emphases on providing students with a strong foundation in analytical techniques and on cultivating close ties with industry.

"All of our programs have a strong analytics core and are aligned along the needs of our graduates and their employers," said Terlaky, who is also the George N. and Soteria Kledaras '87 Endowed Chair Professor.

"Our unique partnership with the ESC enables our students to build their expertise in real industry settings, while being mentored by experienced professionals.

"To stand in the spotlight of national prominence two years in a row confirms the exceptional qualities of the ISE department."

The UPS George D. Smith Prize, offered for the first time last year, was established to strengthen ties between industry and the schools of higher education that graduate young practitioners of operations research.

INFORMS awards the prize to an academic department or program for preparing students in an effective and innovative manner to be good practitioners of operations research, management science, or analytics.

The UPS George D. Smith Prize is named for the late CEO of the United Parcel Service, who was a champion of operations research at a leading Fortune 500 corporation.

"I was pleased that the INFORMS program committee recognized the focus we place on developing consulting and leadership skills," said Emory Zimmers, ESC director and professor of industrial and systems engineering. "This focus includes several courses we offer in leadership development as well as our optional leadership minor.

"It was also gratifying to see recognition given to the ESC Collaboratory, which facilitates virtual teleconferencing with corporate sponsors, student teams, and ESC mentors."

While the Naval Postgraduate School was chosen from among the three finalists to receive the Smith Prize, the Lehigh team received unique recognition for being the only program to be selected as a finalist two years in a row. Besides Lehigh, last year's finalists were the University of Michigan and Cornell University.

ISE Annual Banquet and Awards 2013

Ralph E. Gomory, New York University research professor, former head of IBM's Research Division, former president of the Alfred P. Sloan Foundation, and founding contributor to the field of integer programming, was the Industrial and Systems Engineering Department's 2013 Spencer C. Schantz '55 Distinguished Lecturer.

Gomory's technical talk, entitled "Problems Create Mathematics," discussed his view that even in today's world with all its riches of mathematical knowledge, practical problems still cause the creation of new mathematics.

Of all of his numerous achievements, one of his largest was discovering the "Gomory Cut." It is well known that this emerged from his exposure to Navy problems while serving in the U.S. Navy. In his technical lecture Dr. Gomory described how the apparently mundane need to speed up a calculation so that it could run on the small computers that paper mills could afford actually led to new theoretical understandings in integer programming.

During his tenure as director of the IBM Research Division, his greatest accomplishment was building a research organization in an industrial setting.

"You figure out what to do to contribute both to the company and to the world. The IBM Research Division is still there today, and it is thriving," said Gomory. "Industrial research labs can affect major industries. But trying to get a gain every quarter does not usually provide a stable background for doing important research."

As president of the Alfred P. Sloan Foundation for 18 years, Gomory's most memorable accomplishment was the development of online education. Lehigh's Distance Education currently has more than a thousand students enrolled.

"We started online learning in

1991, and the initiative grew steadily. This last academic year there were 7 million different individuals enrolled online and taking at least one college-level course for credit."

In Gomory's public lecture, "New Goals for American Corporations," he discussed what we should expect of our great American corporations.

"One of the country's biggest economic challenges is to get more corporations to work in the interest of the country as a whole," said Gomory. "Educators need to question the teaching of shareholder value as the main purpose of the corporation."

Gomory was also recognized at the annual ISE banquet on Thursday, April 18. This annual banquet celebrates the department's students, faculty, and alumni for their accomplishments. For the third time in a row, Professor Robert Storer won the Faculty Member of the Year Award, which is voted by the department's students.

Dr. J. Robert Baum '64 won the 2013 Distinguished Alumni Award for achievements in industry. Baum is the chairman of the board of Highmark Inc., a position he has held since 2005. He was also acting CEO of Highmark in 2012. In that role, he leads the board review of Highmark's performance and strategic plans.

In addition to his service to Highmark, Baum is professor of entrepreneurship in the University of Maryland's Smith School of Business. He is the former owner/president/CEO of Ivan C. Dutterer Inc. in Hanover, Pa., and Wood Alive Woodworks in Manassas, Va., and Ithaca, N.Y.

Baum teaches new venture creation and financing for Master of Business Administration students, and he has won five university teaching awards since 2000. His research interests are entrepreneurship, quantitative methods, and strategic decision-making. Baum is also a member of the Lehigh University Healthcare Systems Engineering Industry Leadership Council.

Imagineer That

Once upon a time, in a land far away (actually not too far away from Bethlehem, in Pottstown, Pa.), Gena Levengood '13 sat in front of her TV watching the Disney Channel. Short mini documentaries called Imagineer That would discuss how Disney engineers made the rides, animatronics, and other engineering concepts.

Fast-forward to 2012, and Gena is a student at Lehigh and has the opportunity to co-op down at Disney in their Costuming and Entertainment department.

"I enjoy being creative in addition to working with numbers and have always dreamed about working in Disney," said Gena. "I wanted to experience working in a different industry. Entertainment is very unique, but it's interesting to see how the operations are run behind the scenes."

During her co-op, Gena's largest project was implementing RFID (radio frequency identification technology) into character and operational garments. RFID is similar to what is in the E-ZPass in your car, but it is an up-and-coming tool in supply chain management and inventory planning.

"Instead of scanning each of the 80,000 costume pieces by hand with a barcode, RFID enables the wearer to wave it over a sensor to check it out," said Gena. "In addition to checking the costume, it helps plan inventory on a larger scale for the resort."

The bulk of her internship was leading a team through the costume implementation of the RFID technology. The IE curriculum was used throughout the course of her co-op.

"I was also involved in a cost-savings project, where I came up with a design for an experiment to determine potential causes for $2 million in annual garment loss," said Gena. "A scanner was set up at the door of the costume facility where cast members would walk out of. The intent was to confirm all costumes leaving the facility were correctly issued to the correct staff member."

They conducted tests during peak transaction times, and then afterward analyzed the data to confirm all garments were correctly assigned. The team looked for trends in incorrectly assigned garments. By doing this, they could determine if the scanners needed to be turned up to a higher sensor level in order for the garments to be scanned correctly.

"I loved how Disney takes something from the movies and engineers it into a ride/show/themed restaurant," said Gena. "This position provided me with unique hands-on experience and allowed me to work on a specialized project."

Her magical experience would not have been possible without the help of Lehigh Career Services and IE alumna Megan Kelleher '10.

"The Lehigh co-op program gives you the chance to discover what you like versus what you don't like in a job," said Gena. "It was a great way to meet new people, see different industries, get real hands-on experience, and apply your studies from class directly to the job."

Presidential Scholarships making the difference

The Lehigh President's Scholar Program recognizes outstanding academic achievement by undergraduate students by providing a fifth year (i.e., a ninth and tenth semester) of study free of tuition. Students must maintain a 3.75 at the time of application for the scholarship. Many ISE students receive this scholarship, and many of them stay in the department to complete their master's degree.

"Receiving this scholarship meant another year of wonderful Lehigh experiences and the opportunity to meet more great friends," said Lorand Dragu '12, '13G, who just completed his Master's of Engineering in Industrial and Systems Engineering.

"I chose this major because I really enjoyed my time in the department as an undergrad and I wanted to learn more from my favorite professors," said Lorand. "I also wanted to complete another project with the ESC and my favorite mentor, Doug Sunday."

The project he was working on was with PECO in Philadelphia. The goal was to improve the call forecasting and staffing process for their customer call center. Lorand and the ESC team presented "as-is" process maps with suggested improvements and completed an ARENA simulation model for each call center that would provide new capabilities for sensitivity analysis and "what-if" scenario analysis.

"Being able to complete these types of projects prepared me for my career in lean manufacturing at W.L. Gore in Newark, Delaware."

In addition to working on a project for a large company and taking courses, Lorand was also a volunteer firefighter for the Se-Wy-Co and a volunteer EMS for Lehigh.

"Being a volunteer firefighter and EMS was fun, and I was able to help a lot of people in their time of need."

Lorand, who was born in Timisoara, Romania, and moved to Decatur, Alabama, in 2002, also won the ISE department's master's degree student of the year award.

"I am very flattered, and it means a lot to me because it is from a group of respected faculty members," said Lorand.

"I enjoyed the laid-back yet practical attitude of the professors; I would say my classes were run efficiently—appropriate for our department."

Lucky (20)13

During the past four years, the Class of 2013 has been keeping busy in and out of the ISE department. Here are some of their parting thoughts, plans for after graduation, and their biggest inspirations.

Emily Koehler '13

Hometown: Mertztown, PA
Major: Information & Systems Engineering

What are your plans after graduation?

I will be entering the Technology Advisor Program in the Financial Services Office at Ernst & Young (E&Y) in New York City.

Who was your mentor in the department?

One of my mentors in the department was Professor Thiele, who was my optimization models and financial optimization professor, in addition to my freshman adviser. I was so happy to have her advise me as a freshman, and I could tell that she would be a long-term adviser after she asked how my brother, who was an I&SE '06, was doing post-Lehigh. Although I had come into Lehigh declared as an I&SE, she further helped me to realize that I made the right decision. I thoroughly appreciated her positive, quirky attitude and passion for teaching and research.

What is your favorite memory from the department?

My favorite memory of the department was at this past year's ISE Council Networking Event. Since I interned at E&Y last summer, I was asked to stand behind the E&Y table to talk to potential interns and new hires about my experience. It was an elevating moment when I felt like my Lehigh experience had come full circle.

Meltem Ozmadenci '13

Hometown: Istanbul, Turkey
Major: Industrial Engineering and IDEAS (with concentrations in Design Arts and Industrial Engineering)

What are your plans after graduation?

I will be attending Columbia University to get my master's degree in Operations Research.

Who was your mentor in the department?

Doug Sunday from the Enterprise Systems Center. Although he was not a "teacher," he is one of the people whom I learned the most from during my four years at Lehigh. I learned not only how to systematically analyze problems, but also how to be calm and behave professionally in hard, sometimes seemingly impossible, situations and, most importantly, how to "tell my story."

What is your favorite memory from Lehigh?

When I presented my senior project at the Undergraduate Research Symposium. The fact that I was nominated by my department and received an honorable mention at the end of the competition made me realize that my education has already started making a recognizable impact.

Jake Schwartz '13

Hometown: Telford, PA
Major: Information & Systems Engineering

What are your plans after graduation?

I will be moving to the Washington, D.C., area to work for Ernst & Young in their Technology Advisor Program as a consultant.

What will you miss the most from the department?

I am going to miss Mohler Lab as a whole. I have spent so many hours working in the first floor lab on projects, taken countless trips on the slowest elevator on campus, and spent a lot of time with close friends over the past four years. Mohler is a unique building on campus that only a few know about, and I am going to miss it a lot.

Anything else you would like to add?

The ISE department isn't the largest at the university, but those who choose it really gain a lot of experience. It features both young and seasoned professors, which creates a diverse academic environment that compels students to adjust quickly to changing teaching styles. The department features great communication between students and alumni, and I am looking forward to hearing future news regarding ISE.

Alana Shuster '13

Hometown: Rockville, MD
Major: Industrial Engineering

What are your plans after graduation?

I will be working at PriceWaterhouseCoopers as an Advisory Technology Associate Consultant in McLean, Virginia.

Who was your mentor in the department?

I did not have just one mentor; many professors helped me along the way. Dean Tonkay was there from the very beginning. He was one of the main reasons I chose IE as my major. Professors Pamukcu and Erke-Magent were always available when I needed guidance or any sort of assistance throughout the years, whether it was personal or school related.

What is your favorite memory from the department?

The banquets! I enjoyed getting to know the department outside of the classroom environment. It is nice to know and be reminded that the professors are people too. They are not just on campus to provide students with an education. They want to better our lives and enrich us in all ways possible.

Faculty Updates

Bob Storer

Bob Storer received the 2013 Major Teaching Excellence Award for the P.C. Rossin College of Engineering and Applied Science. This award is given by the Rossin Junior Fellow seniors for excellence in teaching and student support.

Katya Scheinberg

was given tenure this May 2013.

Aurélie Thiele

is now the co-director of the Master of Science in Analytical Finance.

She gave invited talks at the IBM Watson Research Center and Texas A&M, received a Faculty Innovation Grant, and spent one month as invited faculty at Paris-Dauphine in Paris, France.

New Moves for the Communications Specialist

Since December 2008, communications specialist Amanda Fabrizio '13G has been communicating effectively to our alumni and the Lehigh community about what has been going on in the ISE department. We are sad to report that this will be Amanda's last publication as editor of the newsletter, as she has accepted a new position at Immaculata University near Philadelphia. Amanda would like to thank the ISE department's students, alumni, staff and faculty for an amazing and memorable four-and-a-half years! We thank her for all of her hard work and wish her well in her new adventure! Please join us in congratulating Amanda on her new position.

Frank E. Curtis receives Department of Energy's Early Career Research Program Award

Assistant Professor Frank E. Curtis has received the Department of Energy's Office of Science Early Career Research Program Award. He will receive $750,000 over five years for his proposal entitled Fast, Dynamic, and Scalable Algorithms for Large Scale Constrained Optimization.

"It's an honor to be selected. This award will go a long way to support my research and my research group," said Frank. "It gives us an opportunity to focus on our research now that the support has been secured."

The program, now in its fourth year, is designed to bolster the nation's scientific workforce by providing support to exceptional researchers during the crucial early career years, when many scientists do their most formative work. Frank is one out of 61 researchers nationwide to receive this award.

"Scientists and engineers are constantly faced with the task to optimize an objective subject to physical, environmental, or resource constraints. The technique of using mathematical models to formulate and find real solutions for such problems is known as mathematical optimization, a process that has become invaluable for design and discovery in numerous scientific fields," said Frank.

His project will involve the development of algorithms and implementation of high-performance computing software for solving cutting-edge optimization problems. These include problems that involve data uncertainties, such as those in the future supply, demand, and capacity of a given power system, extreme numbers of alternatives, such as in the design of electrical power grids to avoid network vulnerabilities, and real-time decisions, such as in the control of chemical reactors.

"The key features of these new algorithms are that they will be fast, dynamic, and scalable to meet the computational requirements of scientists and researchers working to optimize large-scale, complex systems," said Frank.

"The key features of these new algorithms are that they will be fast, dynamic, and scalable to meet the computational requirements of scientists and researchers working to optimize large-scale, complex systems"

Frank also conducts research that includes extensions and a broadening of topics that started with his doctoral research, which he conducted at Northwestern University until receiving his Ph.D. in 2007.

"There are a variety of well-known and well-studied numerical methods for solving nonlinear optimization problems. However, the types of problems that people want to solve today are larger and more difficult than these techniques can handle," said Frank. "A goal of my research is to produce open source high-performance computing software that can be distributed to researchers and other users of optimization methods that is able to solve modern problems."

After coming to Lehigh in 2009, Frank has collaborated with researchers at the University of Washington, University of Colorado at Boulder, University of Basel, Johns Hopkins University, Northwestern University, New York University, and IBM's T. J. Watson Research Center. He will also soon be collaborating with scientists at Department of Energy laboratories. However, he feels that his colleagues at Lehigh are some of his best resources.

"I like Lehigh because of its size. It's easy to network and interact with other faculty members," said Frank. "We have one of the strongest groups in numerical optimization in the world."

ISE Technology Renewal Fund

Providing stable and latest facilities for our future leaders

Analytics, computation, and applied math are at the heart of a modern ISE education. The ability to apply analytical and computational skills and tools to improve products and processes is fundamental to our students' future. As a result, the ISE curricula heavily employ computational methods and tools as an essential component of an ISE education.

The department is creating a Technology Renewal Fund to maintain the caliber of education by providing the best facilities to our students and faculty for courses and research.

Mohler Lab has two computer labs dedicated to providing the ultimate "hands-on" learning experience. Students use our computer lab facilities to complete assignments and projects in a wide variety of courses. Having a sufficient number of up-to-date computers readily available provides a much needed interactive classroom space as well as independent work space for students.

The ISE Technology Renewal Fund will provide stable and predictable funding to update the lab and classroom computers in Mohler Lab. There are 160 undergraduate and 170 graduate students who use these labs throughout the academic year. For the department's educational mission and to continue our society's changing research, it is critical to have an up-to-date computer lab.

The ISE Technology Renewal Fund will provide stable and predictable funding to update the computers in Mohler Lab.

We would hope with your support that we will be able to maintain the quality and caliber of the learning experience for our current and future Lehigh ISE students.

For more information about the fund, please visit our website at www.lehigh.edu/ise/techfund.html.

The next generation of giving

Matt Raborn '13 had no problem telling me why he gave back to Lehigh.

"I split my gift between the ISE department, the Gryphon Society, financial aid and scholarships," said Matt. "I know my gift is going towards something I really care about."

Matt along with 20 members of the senior class was on the Senior Class Gift committee. The goal of the committee was not just to raise money for Lehigh and for participation, but also to educate the current students about giving.

"The best way that we have found to educate students about giving is word of mouth," said the Flemington, New Jersey native. "We realized once we told them what the money was going towards, and once one of their peers gave, the domino effect would happen."

Matt continues to say that having alumni support and involvement during the senior gift has been a huge support. A generous anonymous donor was matching senior gifts throughout the course of the academic year. Once the word spread that their gift would be more than what they were giving, it was a great deal that seniors could not say no too.

"Zahir Carrington '10 discussed that without financial aid and the support of our generous donors, he might not have been able to attend Lehigh," said Matt. "Young alumni talking about experiences, school spirit and that support is all around campus really shows how important their involvement is."

During their committees planning of events, communications and workshops, Matt found that using his IE degree was extremely helpful to have.

"By the mid-year, we still had quite a few students that still do not give to the senior class gift. We split the remaining non-

donors between the committee members, so we could bring them consultation lunches to discuss the Lehigh Fund," said Matt. "By doing this, and having them help us spread the word, it saved money by having certain amount of lunches and made our job easier talking to people who may have not listened to us before."

After graduation, Matt will be a presidential scholar working on his master's in Management Science and Engineering. As a member of the senior class gift committee, Matt plans to continue to support Lehigh after graduation.

"I have a lot of connections around campus that allowed me to see a lot of room for growth and the best way to do that is by volunteering and giving back," said Matt. "I understand the value of a Lehigh education and I want to make sure that it continues for years to come after I leave."

Call for nominations!

We are looking for nominations for the ISE Department Distinguished Alumni Award.

The award is presented to graduates of the department who have distinguished themselves professionally, made significant contributions to society, and through their achievements have reflected credit on Lehigh. If you would like to nominate a fellow alum for this award, please send the individual's name and class year to Tamás Terlaky at terlaky@lehigh.edu.

Remembering Arthur "Pete" Veinott '56

The 2012 ISE Distinguished Alum for Achievements in Academia, Arthur "Pete" Veinott '56, passed away this past December. He was 78.

Veinott was an expert in the field of operations research, which applies advanced analytical methods to help managers make better decisions. He made major contributions to the theory of operations research and to its development as a field both at Stanford and nationally.

He began at Stanford University in 1962 and served until retiring in 2009. During his career, Veinott played a key role in the creation and development of the Department of Operations Research, including serving as department chair from 1975 to 1985. Operations Research would later be folded into the Department of Management Science and Engineering.

He also helped found the journal Mathematics of Operations Research. It remains the leading journal for the publication of mathematical contributions to operations research and management science.

Wide-ranging contributions

Professionally, Veinott had three main contributions to his field: lattice programming, inventory theory, and dynamic programming. In lattice programming, Veinott developed a type of qualitative optimization theory to predict the direction and nature of change in global systems.

"Pete was a legend in the operations research community," said Frieda Granot of the Sauder School of Business at the University of British Columbia. Lattice programming had a profound effect on economics and in such classical operations research areas as production planning, project planning and scheduling, reliability and maintenance, and network optimization, she said.

Researcher and mentor

Throughout his academic career, Veinott was devoted to research and teaching, publishing 56 papers and guiding 27 students to their doctorates.

"From the first time I met him, I was impressed by his intellect, his wit, his intellectual curiosity, and his encyclopedic knowledge of operations research," said Dimitris Bertsimas, co-director of the Operations Research Center at the Massachusetts Institute of Technology.

"As an editor, he maintained very high standards on research and exposition. Even recently, he was up on the latest research, the best results, and the best young people. His spirit of excellence will live on through the students he educated in his almost half-century at Stanford."

A long legacy

Veinott earned his Bachelor of Arts and his Bachelor of Science from Lehigh in 1956. During his tenure at Lehigh, he was a member of IIE, Student Activities Committee, and Tau Beta Pi, was elected to Phi Beta Kappa, and was a brother of Theta Chi Fraternity. He earned his doctorate in industrial engineering from Columbia University in 1960.

Veinott served in the Air Force Logistics Command as an operations analyst until 1962, when he joined the Stanford faculty as an assistant professor of industrial engineering. He remained there until his retirement.

"Pete completed a trifecta during the 1975-1976 academic year: He began a 10-year tour as chairman of the Department of Operations Research at Stanford, founded the journal Mathematics of Operations Research, and led the campaign that created the John von Neumann Theory Prize awarded by the Institute for Operations Research and the Management Sciences (INFORMS)," said his colleague Professor Donald Iglehart.

In 2002, Veinott was named an inaugural Fellow of INFORMS, and in 2007, he won the prize he helped create. He was elected to the National Academy of Engineering in 1986, was selected as a Fellow of the Institute of Mathematical Statistics, and won a Guggenheim Fellowship in 1978-79.

During his final visit to Lehigh this past April, Veinott was the 2012 Spencer C. Schantz '55 Distinguished Lecturer. He gave two lectures, titled "Polytime Computation of Strong and n-Present-Value Optimal Policies in Markov Decision Chains" and "Optimal and Near Optimal Supply Policy for Deterministic Multiperiod Supply Networks." Both abstracts can be found on the Spencer C. Schantz '55 Distinguished Lecture web page.

"Pete was one of the legends of our field, and was one of my most brain-stimulating friends. He never stopped thinking of either a research problem or how to serve the community," said Tamás Terlaky, Lehigh's ISE department chair and the George N. and Soteria Kledaras '87 Endowed Chair Professor.

"He was a proud and thankful Lehigh alum. He fondly remembered his time here and the opportunities a scholarship gave him, and therefore Pete never forgot to give back to Lehigh. The ISE community will never forget the lectures he gave this past year."

Article by Andrew Myers, associate director of communications for the Stanford University School of Engineering.

ISE Legacies

For decades, the department sees legacies of families come through Mohler Lab. Fathers and sons, mothers and daughters, and vice versa, brothers, sisters, cousins, aunts, uncles, grandchildren, you name it, we see the same last names appear over and over again. This clearly shows what the department and Lehigh have meant to these families.

This section of the newsletter will now be dedicated to ISE legacy families and the impact that the department and Lehigh have made on their lives.

The Lesker Family

Chi Phi fraternity brothers Kurt Lesker III '71 and Kurt Lesker IV '05 chose Lehigh for very different reasons.

"I chose Lehigh because I wanted to study engineering, and I chose between Lehigh and Carnegie Tech because Lehigh's ivy walls looked like a real university I imagined at 18 years of age," said Kurt III. "I chose the IE department after studying dynamics with Wally Richardson. I knew that I did not want to be an engineer, but rather use engineering to run business and understand technical matter."

"Before any campus visits, I decided to go to Bucknell. They had been ranked as having the best-looking women, and for a boy of 18 that was pretty important. After considering the longer-term implications of choosing a college and after visiting both campuses, I found that my decision was clear—Lehigh. It was not the serene mountainside campus or unexpectedly beautiful women (including my future wife) that changed my thought process," said Kurt IV. "The major turnaround came down to one thing—industrial engineering. Bucknell did not have it, but Lehigh did. My real interest was in business, and it was clear to me that business and technology were going to continue to merge."

The core engineering disciplines are essential, but learning how to optimize multidisciplinary processes and people to achieve desired outcomes is what business management is all about.

Kurt III became president of the Pittsburgh-based Kurt J. Lesker Company in 1979, and is still president to this day. Kurt IV is the director of global quality and deputy general manager for sales in Asia. Going through the IE curriculum has been ideal for owning and running a company.

"The industrial engineering degree has been spectacular," said Kurt III. "I got the exact broad-based science and engineering background I needed to be able to communicate and understand and design solutions for technical matters, especially in our vacuum industry business."

"Industrial engineering offered the perfect blend between engineering and business. The core engineering disciplines are essential, but learning how to optimize multidisciplinary processes and people to achieve desired outcomes is what business management is all about," said Kurt IV.

As legacies of the department, the Lesker family cherishes the time that they had at Lehigh and never forgets to pay it forward.

"In my four years at Lehigh I met several Lehigh legacies. It is a testament to Lehigh that so many next generations decide on Lehigh," said Kurt IV. "For me it was a chance to 'carry the baton' and continue to positively influence the history of a great institution. Thankfully Lehigh was progressive and allowed me to make a lasting mark when they allocated $6 million for the Hawk's Nest that Ric Longenecker '05 and I pitched to then President Farrington during a lunch meeting. He would later call it his 'most expensive lunch' during the 2005 graduation ceremony."

"The alums are the ones who have used the education in the field," said Kurt III. "Giving back enables us to help improve and address the future needs and direction to make Lehigh ISE an even better place."

ISE Legacies

Will '15 and Vincent Pagano '72

"I have always used my family's achievements as motivation"

The Pagano Family

"I didn't even know what an IE was when I began studying engineering. I started in Civil Engineering and switched during my sophomore year," said Vincent Pagano '72. "I switched to IE for the broader perspective on engineering that it offers, which suited my personality and interests much better."

For 32 years, Vince put his IE degree to work in the Capital Markets Practice Group at Simpson Thacher & Bartlett, a group he headed for 13 years before his retirement at the end of 2012. Following his retirement, he was elected to the boards of directors of Manhattan-based L-3 Communications, New Jersey–based Hovnanian Enterprises, and Houston-based Cheniere Energy Partners. He is also a member of the P.C. Rossin College of Engineering and Applied Science Advisory Council. He also has the joy of being a Lehigh parent to his son Will.

"I am, of course, extremely proud that my son Will has elected such a high-quality and challenging program as ISE. I admit I am also more than a little surprised that he has ended up studying what I did. I promise I have not sought to influence him on this," said Vince. "Will came to Lehigh and is studying in the Integrated Degree in Engineering, Arts and Sciences (IDEAS) program. This program is part of what makes Lehigh great and was so attractive to someone like Will who has such disparate interests, yet at the same time he can challenge himself and earn a very valuable degree in a mainstream major like ISE."

Will Pagano '15 said the IDEAS program allows him to continue to do what he likes to do best: follow a range of interests throughout his college experience.

"I am so lucky to have found the IDEAS/ISE program combination at Lehigh," said Will. "I grew up in New York City, so engineering dominated the physical landscape. From the Brooklyn Bridge, to the World Trade Center, to the Flatiron Building, to the Empire State Building, , to Grand Central Station, through the Helmsley Building, to Central Park, to the Met and the Guggenheim, to my building—I marveled at the creative beauty of engineering. However, I did not understand that structures also could be intangible—that engineers could build systems. Now, ISE permeates my experience in NYC."

As Will heads into his junior year, his father's legacy is instilled in his mind. Vince graduated summa cum laude from Lehigh, and it is Will's goal and ambition to achieve similar academic success. "I have always used my family's achievements as motivation. My father, through his hard work and success, has instilled in me a deep determination to take pride, find meaning, and excel in my academic endeavors at Lehigh," said Will. "My father taught me that hard work alone yields success. It means a great deal to me to have the opportunity to follow in his footsteps. I think, although he will not say it, that he is very proud and happy that I chose to attend the same university that enabled him to achieve the level of success that he has."

"Lehigh prepares its graduates for success," said Vince. "Our family is looking forward with great anticipation to Will's successes, wherever they may be. Lehigh's alumni base is accomplished, loyal, and enthusiastic, a pleasure and a privilege for Will to join. We will soon have another great bond between us."

TERM and Lehigh Host Healthcare Summit

Trends Emerging in Risk Management (TERM) and the ISE department in collaboration with the Lehigh Integrated Healthcare Delivery cluster and the Healthcare Systems Engineering program held a one-day summit in Washington, D.C., this past May.

The summit's goal was for multiple professionals to share advanced practices and methods to help support the goals of pharmaceutical safe usage, including REMS assessments.

Risk Evaluation and Mitigation Strategy (REMS) assessments remain challenging for many stakeholders including pharmaceutical industry regulators, healthcare providers and patients. The industry lacks systematic methods to determine the extent to which REMS programs contribute to drug safety. The Prescription Drug User Fee Act (PDUFA-V) reauthorization highlighted REMS assessments improvements as a shared goal between the pharmaceutical industry and the FDA.

TERM is a community that consists of pharmaceutical safety risk management and healthcare professionals who meet periodically to participate in roundtable discussions regarding trends in the constantly changing and evolving environment. Topics of discussion revolve around problem solving, advanced mutual learning, and experience sharing.

Among the more than 50 registered participants were eight FDA staff members. Feedback from participants has been overwhelmingly positive about the program in general, with numerous specific comments about participants' discovery of the utility of systems engineering methods to solve healthcare problems.

TERM is a community that consists of pharmaceutical safety risk management and healthcare professionals

MOPTA 2013 held at Lehigh

The department hosted the annual Modeling and Optimization: Theory and Application (MOPTA) conference for the fifth year in a row. Chaired this year by Dr. Frank E. Curtis, the three-day conference aims to bring together a diverse group of people from both discrete and continuous optimization, working on both theoretical and applied aspects.

The conference had 50 contributed talks from both the academic and industrial fields and offered a wide selection of topics and the traditional MOPTA-AIMMS modeling competition.

MOPTA had seven plenary speakers this year: Brian Denton (University of Michigan), Abhijit Deshmukh (Purdue University), Omar Ghattas (University of Texas at Austin), Ignacio Grossmann (Carnegie Mellon University), Zhi-Quan (Tom) Luo (University of Minnesota), Jorge Nocedal (Northwestern University), and Henry Wolkowicz (University of Waterloo).

This was one of the many memorable quotes Dr. Richard Tapia, university professor, Maxfield-Oshman Professor in Engineering, and the director of the Center for Excellence and Equity in Education at Rice University, discussed during his visit to Lehigh this past spring.

During his public lecture, titled "Crisis in Higher Education: The Need for New Leadership," Tapia discussed the need for supporting and mentoring Under Represented Minorities (URM) in the higher education system. He encouraged the audience to motivate, encourage, and direct URM students so they are able to succeed.

"While recruiting URM students, universities should look to see if the student will be a good fit," said Tapia. "When they accept the student, they want to make sure that they are prepared to succeed, that they will be happy and will make the institution a better place.

"Higher education professionals need to understand that people come from all different paths and backgrounds to get where they want to go," said Tapia.

"I thought his talk was enlightening," said Patty Garmirian, a Ph.D. student in the math department. "The statistics were very interesting. The story he told about the one minority student in a class getting a C, while the rest got A's, when it was an automatic A for the class, was eye-opening."

Dr. Tapia's mathematical research is focused on mathematical optimization and iterative methods for nonlinear problems. His current research is in the area of algorithms for constrained optimization and interior point methods for linear and nonlinear programming.

"The critical need my research addresses is how math tools can solve problems," said Tapia. "Better science will provide better technology to solve the world's problems. The main goal of my research is to try to make the world a better place."

"I have known Richard for more than 20 years, and I believe he is one of the greatest men of our time," said Tamás Terlaky, Industrial and Systems Engineering Department Chair and the George N. and Soteria Kledaras '87 Endowed Chair Professor. "He is not only a great researcher, but a caring husband and father, not just to his own children, but for all of his students and anyone whom he senses he can help."

It was for Dr. Tapia's pioneering and fundamental contributions in optimization theory and numerical analysis and for his dedication and sustained efforts in fostering diversity and excellence in mathematics and science education that he was awarded the 2010 National Medal of Science from President Obama. This experience was extremely humbling and validating for him.

"When President Obama said that I have 'provided a great value to the nation,' that validated that everything I was doing in my life was correct," said Tapia.

"Dr. Tapia's experiences and important messages in his two talks will be of a great value to the university," said Dr. Henry Odi, Vice Provost for Academic Diversity. "He came to Lehigh University as a visitor and left as a friend."

Dr. Tapia provided several quotes during his lecture about how to be better professionals, mentors, and champions in diversifying the field and life in general.

"If you don't achieve everything you dream about, it's still a wonderful life."

Optimizing Energy Systems

Mohsen Moarefdoost '15Ph.D. was quite surprised when they called his name at this year's ISE banquet as the Ph.D. candidate of the year.

"I'm honored to be the Ph.D. candidate of the year, and it means a lot to me that the ISE department has selected me," said Mohsen. "I have had several happy moments in my academic life; winning this award is the best one."

A native of Iran, Mohsen came to Lehigh in 2011 to pursue his Ph.D. in Industrial Engineering. He began working with Professor Larry Snyder on his research topic entitled Optimization in Energy Systems. His research entails developing novel techniques and mathematical algorithms for optimizing energy (especially renewal energy) systems.

"By developing mathematical models and algorithms, we get insights on energy systems in order to manage and operate them efficiently and effectively. The research will answer challenges related to the development of current and new energy resources."

Mohsen's research has two topic areas that he is working on. The first topic is titled Generation and storage dispatch in stochastic electricity networks, and the second is Optimal design of arrays of wave energy conversion (WEC) devices in stochastic sea environment.

"For the first topic we present methods for optimizing generation and storage decisions in an electricity network with multiple unreliable generators, each co-located with one storage unit, and multiple loads under power flow constraints. This problem cannot be optimized easily using stochastic programming and/or dynamic programming (DP) approaches. Therefore, we present several heuristic methods to find an approximate optimal solution for this system.

"In the second topic we develop optimization models and algorithms for designing the locations of wave device conversions within an array (wave farm) by considering the interactions of waves in the sea environment in order to get optimal and yet robust total power output of the wave farm," said Mohsen.

Along with his research, Mohsen also has been a lab educator in the Robotics and Automation Lab and a teaching assistant for several IE undergraduate and graduate courses. Mohsen has found the atmosphere of the department energizing both socially and academically.

"I am thankful to the faculty, staff, and students of the department, who provide us with not only the best educational environment, but also a friendly and sociable atmosphere to research and study."

To read more about Mohsen's research, please visit his website at http://phd.ie.lehigh.edu/~mom211/.

Engineering the Gridiron

You could not miss Tom Ruley '13 walking through the hallways of Mohler Lab. Besides the fact that he was a 6-foot-4-inch offensive lineman for the Lehigh football team, it was his Green Bay Packers' green and gold gear that gave him away.

"I was born in Aberdeen, South Dakota, before moving to Baltimore, Maryland, when I was 12," said Tom. "I watch the Packers ever Sunday. I loved Brett Favre, and visiting Lambeau Field was an experience all in itself."

Tom started playing football when he was in the eighth grade, and enjoyed being a part of the team and the tradition.

"Lehigh's football tradition, especially, has been such an honor to play for during these past four years," said Tom.

This spring semester, Tom received the Barry Fetterman Award, which is given to the football player or players who best exemplify loyalty, dedication, and unselfishness. Though injured, he started 10 games at center, anchoring an offensive line that allowed just seven sacks in 11 games.

"This award means a lot to me. I take pride in representing Lehigh on and off the field," said Tom. "It validates how hard I have worked over the years to get to where I am currently at."

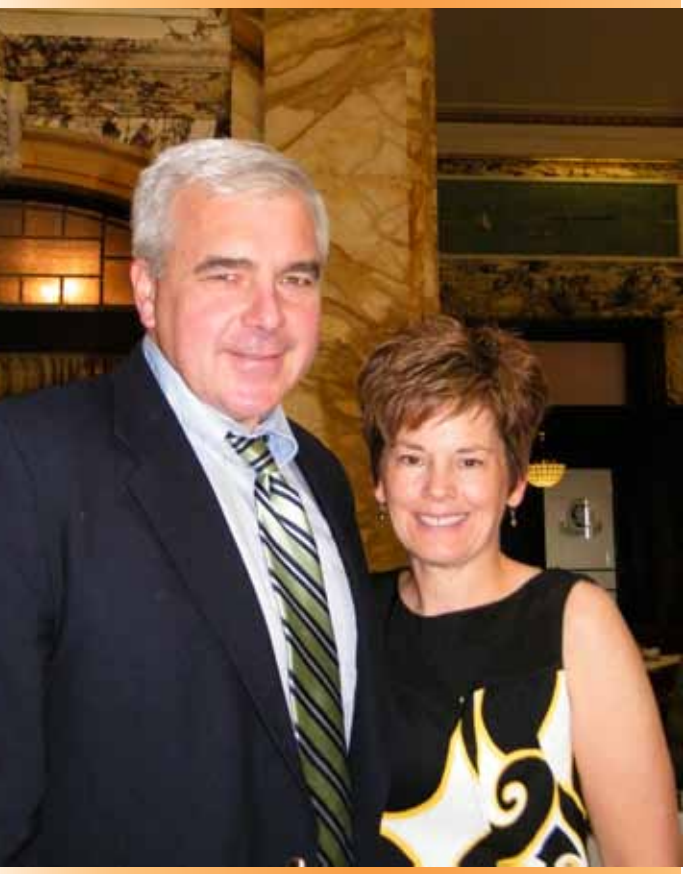
After a discussion with Associate Dean Greg Tonkay about switching to industrial engineering from civil, he began to see several IE problems while he was playing football.

"There are several opportunities for organizational planning, preparing for situations, and forecasting when it comes to the game," said Tom. "When I had to learn how fast the game was, I realized that simple, quick movements were better than long, fast ones. This relates to what we do as IEs in processing and planning."

Even while recalling practicing in 105-degree heat during summer training camp, Tom will bring the toughness and lessons he learned from the team and the department wherever he goes.

"Regardless if it's preparing for an exam, playing in inclement weather, or confronting a tough situation in your company, if you love it that much, it doesn't matter what you go through to continue to strive to succeed."

Advancement Spotlight



Richard J. Titus, Jr. ’81, ’86G and Lisa Dippre Titus ’82

Why do you feel it is important to give back to Lehigh and the ISE department?

Lisa and I were both the recipients of financial-need-based scholarships. Lisa’s was linked to academics while mine was linked to athletics. Without this aid we would not have been able to afford a Lehigh education. Therefore we feel it is important to support Lehigh and have done so in a number of ways. We have contributed at the Asa Packer level since our graduation and have given to Goodman Stadium, various scholarships, the annual fund, and most recently dedicated an office in the ISE department to Dr. Mikell Groover. Both of us feel it is important to give back since we are helping support students with the opportunities we were blessed with here at Lehigh.

You gave your gift in honor of Professor Mikell Groover. How did he influence you both?

Dr. Groover was a special undergraduate mentor to me. I had a number of classes with him and more importantly got to know him on a personal basis. His office door was always open. Dr. Groover’s and the ISE department’s dedication to teaching manufacturing methods provided me with a background and foundation that has served me well throughout my career. This one-on-one contact with amazing people such as Dr. Groover, Professors George Kane, Wallace Richardson, and George Wilson, to name just a few faculty members, made Lehigh a very special place. We thought that Dr. Groover’s retirement gave us a special chance to dedicate his former office to him and his lifelong dedication to Lehigh’s ISE department.

What is your favorite memory of the department or Lehigh?

My favorite academic memory was working on Professor Wallace Richardson’s Plant Layout Project. This project, which Professor Richardson made due at the end of Greek Week, ensured nearly 2 weeks of relentless effort and calculations in order to complete the project and avoid failing the course. I believe he truly enjoyed torturing us with this project and getting us ready for the real world.

Lisa and I also worked for Professor Kane during the summers, acting as stewards for the manufacturing seminars. Faith and Kathy, the department’s administrative assistants who were a lot of fun to work with, figured out we were dating, but this eluded Professor Kane until after we finished our summer work.

What advice would you give to current ISE department students and young alumni?

Remember to give back to Lehigh. Many generous people before you aided Lehigh through their donations of time and resources, and we must remember to do the same for today’s generation. Also, don’t give up on American manufacturing; America is still a strong world-class player.

Anything else you would like to add?

I remain truly grateful for the education I received at Lehigh at both the undergraduate (BSIE ’81) and graduate levels (MSMSE ’86). This foundation has served me well throughout my industrial, academic, and consulting career. Those problem-solving skills and the ability to work as part of a team have continued to pay dividends today in my teaching and Lean Six Sigma consulting practice.

ISE welcomes new Advisory Council Members

Richard Holtz '67, Ray Hoving '69, Ravi Kulasekaran '88G, Charles Searight '73, and George Snow '81 have joined the ISE Advisory Council within the past year.

The purpose of the ISE Advisory Council is to provide input and support for the department. This includes advising faculty and the department chair about all of its programs, students, projects, and centers and providing contributions to the department.

Richard Holtz is president of InfiniSys Inc., an electronic architecture and consulting firm founded in 1989. The firm uses the principal's broad operations and senior management background, which includes significant multinational client exposure, to create award-winning designs and continue to develop an award-winning team.

Ray Hoving is in his 10th year as an independent IT management consultant at Ray Hoving Associates LLC. He specializes in aligning IT with business strategy, applications and infrastructure management best practices, and IT project excellence. He also provides educational services to clients in areas such as project management, IT leadership, and executive education.

Ravi Kulasekaran is founder and CEO of Stridus. He is a serial entrepreneur with more than 20 years of experience and has started and led several successful companies. Some of the companies that Ravi has founded and run include Colabus, a Cross Platform, Mobile/ Web App for Private Social Networking and Collaboration; Adtvworld.com, an international video advertising portal; Appshop, a highly successful company that delivered the Oracle E-Business suite of applications in an on-demand mode; and Simplify, a turn-key systems integrator for ERP deployments. Appshop was acquired by AT&T.

Deborah Nagel is currently the Global Creativity Team Leader for Fascia and aero shutters and a senior buyer at General Motors in Detroit Michigan. She creates, coordinates and executes sourcing strategies for new Fascia programs. Deb also coordinates and negotiates with Design Engineering, Vehicle Program Teams, Suppliers, and Manufacturing to achieve savings. She manages and negotiates current production buying deck and engineering changes.

Charles Searight is a consultant at Vector Growth Partners. Charles has more than 35 years of experience both as a line executive and as a consultant helping companies worldwide to achieve sustained revenue growth and increased profitability. He was most recently a managing director at Blue Ridge Partners, where he helped develop their revenue growth practice. Charles' prior roles have included serving as CEO of Canopy International, managing partner at AT&T Solutions, Group VP at Unisys, and partner at Accenture.

George Snow is currently executive vice president at Full Circle Systems, an enterprise software/SaaS technology company focused on automating business processes to increase productivity and reduce costs for the oil and gas industry. Previously, George held leadership positions at Honeywell, McCormack and Dodge, Micro Decisionware, and Sybase with expertise in enterprise resource planning, enterprise system integration, and business intelligence.

The department would like to thank Jennifer Bodenstab '08, Kurt Lesker III '71, Scott McKay '78, and Stephen Senkowski '73 for their time, support, and expertise during their terms on the council.

For more information about the advisory council, please visit WWW.LEHIGH.EDU/ISE/ADVISORY_COUNCIL.HTML.

Q&A with Alper Uygur ’05G, ’11Ph.D.

Alper Uygur received his Master’s in Management Science in 2005 and his Ph.D. in Industrial Engineering in 2011. A native of Turkey, Alper worked at IBM as a senior optimization consultant from 2005 to 2011, designing and rolling out decision support tools for the Service Delivery Planning Department. He currently resides in Texas and works as a senior operations research specialist for BNSF Railway, performing the role as an internal consultant to various departments in the company. After graduating in 2011, Alper immediately began supporting graduate students’ research and professional development by giving to the Graduate Student Senate Travel Grants Fund.

Q. Why do you feel it is important to give back as a young alum?

A. Although there are so many goodwill charities and educational institutions one can choose to donate to, Lehigh University is the place where I spent almost one-fourth of my life and gained the most valuable life lessons, which I am very grateful for. In addition to that, during the time I was pursuing my academic studies at Lehigh, it became apparent to me that success was not solely dependent on hard work, but was also triggered by the collective support and sharing mind-set among our fellow students, ISE faculty, and Lehigh family as a whole. This spirit encouraged me to give back as soon as I had the means of doing so.

Q. Why did you want to give to the Graduate Student Senate (GSS) Travel Grants Fund?

A. If you visit the Lehigh Make a Gift website, you will see that there are quite a few initiatives you can support. Having been a graduate student for eight years, I felt indebted to favor the GSS Travel Grants Fund. GSS was generous enough to provide me with travel support on three different occasions to attend the INFORMS conferences. During the last one, I landed a job that I happily have now. Attending conferences offers essential opportunities for grad students to showcase their work, grow their professional network, and find jobs. Therefore, I certainly believe that this gift is spent for a good and worthy cause.

Q. Which ISE faculty member influenced you the most?

A. My vote would definitely go to Professor George Wilson, my dear adviser. His professionalism, great depth of intellect, and insights on how to address and approach very difficult problems and situations taught me new perspectives in analytical and systematical thinking. I cannot thank him enough for all that I have acquired from him.

> ...learn how to communicate within a team regardless of whether you’re the leader or the contributor...

Q. What advice would you give to current ISE department students?

A. To both grads and undergrads: Work hard, understand what is relevant now and what may be relevant in the future, learn how to communicate within a team regardless of whether you’re the leader or the contributor, and seek out practical experience, the kind that cannot be found in the textbooks. Take advantage of the programs offered by the Lehigh ISE department in collaboration with the ESC. You are one of the few elite who are given an opportunity to spend time in the Harold Mohler Lab. Try to stand out, be visionary, come up with immortal ideas, and engage your precious time only in projects for which you can deliver results that you will be proud of. I can assure you that many industries and academic institutions are already eager to recruit you for your education at Lehigh, but it is up to you to shine even more.

LEHIGH UNIVERSITY

Development of ISE

As the ISE department continues to work hard for continuous improvement, an ongoing excellence in all aspects of educating our students, and the performance of cutting-edge research, support from our alumni and friends is greatly needed. Your generous gift to the department will have a lasting impact on today's students and for generations to come. If you would like to make a gift, please visit mylehigh.lehigh.edu. After you enter into mylehigh, click the "Donate" box and highlight the P.C. Rossin College of Engineering and Applied Science. In the "If Other or Student club" box, please enter the ISE department.

If you are also celebrating a reunion year, you can still designate your gift to the department. If you have any questions, please contact the P.C. Rossin College of Engineering and Applied Science's development director, Maureen Rinkunas, at 610-758-6361 or at mbw202@lehigh.edu.

Reasons to Give to ISE

From Lehigh's earliest history to the present day, the generosity of alumni, parents and friends has been vitally important, supporting what is already excellent about the university and contributing to new initiatives that expand our impact on higher education and our service to the nation and the world. Gifts have an impact on every aspect of our academic mission, our research programs and our campus life.

Designating your gift to ISE has a lasting impact on future industrial engineer leaders. Below are some of the top reasons why you should designate your gift to ISE.

1. Lab and Classroom Preservation
With the newly renovated labs we currently have in Mohler Lab, gifts that enable us to maintain these prime learning and research facilities are extremely important. Keeping the computers, audio-visual equipment, classroom furniture and the manufacturing and robotics lab machines up-to-date is crucial to providing a stimulating educational experience for students.

2. Guest Speakers and Professors
Guest speakers and professors from both industry and academia provide new learning experiences for the ISE department students. They provide a valuable educational experience and input about industrial engineering and the world for faculty, students and friends of the department.

3. Research and Program Development
Cutting-edge research that is done by our faculty and students helps shape our future. Research in our department includes simulation, optimization of healthcare systems and processes, supply chain management, financial optimization, data mining, optimization and high-performance computing. The development of innovative programs, such as Healthcare Systems Engineering, is critical to providing the best education for current and future generations of IEs and ISEs.

4. Asa Packer Society and Capital Campaigns
All gifts that are designated to ISE are counted towards the Asa Packer Society and the Lehigh Capital Campaigns.

5. ISE Legacy
Beginning the tradition and leaving your legacy to the ISE department is priceless. Designating your gift to the ISE department will leave your lasting legacy for current and future generations of students that will develop into tomorrow's leaders.

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