

INDUSTRIAL AND SYSTEMS ENGINEERING

NEWSLETTER 2016

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

ISE NEWS



A few Class of 2016 ISE students pose for the camera after their walking ceremony.

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ISE DEPARTMENT NEWSLETTER FALL 2016

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DEAR FRIENDS,

Greetings! Welcome to the 2016 edition of the ISE Department's newsletter! I trust that you all had a great summer and that you were able to keep cool throughout the unusually high temperatures and humidity!

During the summer, I was able to travel to Denmark, Canada, and Japan for several conferences. Although I always enjoy traveling to different parts of the world, I am thoroughly excited that summer is over and we're beginning the new school year!

I am pleased to announce that after an extensive search, Stephen DeWeerth has been named our new dean for the P.C. Rossin College of Engineering and Applied Sciences. Steve served as Associate Dean of Research & Innovation at Georgia Tech, where he also served as professor of electrical and computer engineering, and of biomedical engineering at Georgia Tech and Emory University. He comes to us with a diverse background in engineering and a wealth of experience in university management.

I am pleased to report that for many years, Lehigh ISE is the highest ranked (graduate & research) engineering department at Lehigh. The School of Industrial and Systems Engineering at Georgia Tech is the number one ISE program in the nation for twenty years in a row. Steve is clearly aware of the importance and potential of ISE for a prosperous RCEAS at Lehigh. He visited and addressed the ISE faculty at our August 25th Department Retreat. All the ISE family is welcoming our new dean and looking forward to making prosperous years of engineering to come.





This past April, we held our annual banquet honoring students, faculty and alumni. Dr. Ronald Askin and Ambassador Richard Verma received Distinguished Alumni Awards for their exceptional contributions to Academia and Industry. We had the privilege of enjoying two Spencer C. Schantz Lectures. Ron Askin shared with us his vast expertise about the key principles and paradigms of ISE, as well as his vision about the future of the profession. Richard Verma shared his vision about technology, innovation and American diplomacy. You can read about their visits on pages seven and eight.

I'm excited to announce that we have a new addition to our faculty. Dr. János D. Pintér joins our department this fall as a Professor of Practice. János is a researcher and practitioner with over forty years of work experience and comes to Lehigh from Canada. In recent years, he taught at Saint Mary's University, Canada and Özyeğin University, Turkey. You can read more about János on page three.

Sometimes with great gains, we have loss as well. This summer, Aurélie Thiele has taken a position at Southern Methodist University in Dallas, Texas. We wish her much success in this new phase of her academic career.

Last year, our students received numerous awards for their excellence in academic achievements, extracurricular activities, in competitions, as graduate and teaching assistants, etc. We made a huge presence at INFORMS 2015 in Philly with staff, faculty and thirty Ph.D. students attending and volunteering at the conference, representing Lehigh. As you already know, Lehigh sponsored and lead the 2015 conference. The volunteers did such a great job that we've been asked to bring twenty Ph.D. student volunteers back to attend and help at INFORMS 2016 in Nashville, TN! As you can tell, I'm proud of what our students, staff and faculty accomplished last year. I'm looking forward to more successes in the new academic year.

It needs to be mentioned that we held a hugely successful alumni event in NYC last March that drew almost 100 alumni. At the event, we launched our Lehigh ISE Affinity Group. The Affinity Group allows and facilitates alumni to stay closely connected to the department. Please join the ISE Affinity Group! We want to hear your ideas about future alumni event locations, ISE alumni activities during the year and at reunion weekends, Lehigh football games, homecoming weekend, etc. We want to hear from you! Of course, donations are most appreciated too and help us make the department better for our students. Every gift helps to elevate the department, helping us maintain our national prominence. Read more about our Lehigh ISE Affinity Group on page 22.

Your support, suggestions, and 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. Also, please remember to stay connected to us through our social media outlets, our Lehigh ISE Affinity Group and by visiting our website (ise.lehigh.edu) to hear about our achievements first!

idor in

DR. TAMÁS TERLAKY Terlaky@lehigh.edu 610-758-4050



DR. JÁNOS D. PINTÉR PROFESSOR OF PRACTICE

Dr. János D. Pintér joined the ISE Department this Fall as a professor of Practice. Dr. Pintér will teach Introduction to Stochastic Models in Operations Research (ISE 230) and two sections on Optimization Models and Applications (ISE 316 and ISE 426).

Dr. Pintér is a researcher and practitioner with over four decades of work experience. His professional interests are primarily related to Operations Research, more specifically: to model, algorithm and software development for nonlinear optimization, including a broad range of applications.

He received his M.Sc. in the area of Applied Mathematics / Operations Research from Eötvös Loránd University (ELTE), Hungary; followed by a Ph.D. in Probability Theory / Stochastic Optimization from Moscow State University; and a D.Sc. in Mathematics / Global Optimization awarded by the Hungarian Academy of Sciences.

Dr. Pintér wrote four books (a university text, a research monograph, and two electronic books), and edited four other internationally published books. He is also the author or co-author of more than 200 articles, book chapters, proceedings contributions, book reviews, and technical reports. His monograph titled Global Optimization in Action received the 2000 INFORMS Computing Society Prize for Research Excellence.

His latest book (published in September) is Space Engineering - Modeling and Optimization with Case Studies, co-edited with Giorgio Fasano. This book presents a selection of advanced case studies that cover a range of real-world challenges and applications arising in space engineering. The mathematical modeling and numerical solution aspects of each application case study are presented in detail.

During his professional career, Dr. Pintér received research grants, awards and fellowships e.g., in Australia, Canada, Hungary, Netherlands, and the United States. He has worked and presented lectures in 40 countries of the Americas, Europe, the Middle East, and the Pacific Region. He worked as an Associate Professor and later as an Adjunct Professor at Dalhousie University, Halifax, Canada between 1991 and 2007. He also worked as a Visiting Professor in Turkey at Bilkent and Özyeğin Universities from 2008 to 2011, before returning to Canada. Until 2016 he worked as an Associate Professor at Saint Mary's University in Halifax, while he remained an Adjunct Professor at Özyeğin University.

Dr. Pintér is the founder and proprietor of Pintér Consulting Services, Inc. (Canada), a consulting company. In this capacity, he is the principal developer of several nonlinear optimization software product versions, implemented with links to spreadsheets, modeling languages, and integrated scientific-technical computing systems. These professional software products are in use around the world by hundreds of academic, business, research, and government organizations.

PROFESSOR LUIS F. ZULUAGA NEW MSAF CO-DIRECTOR ON INTERDISCIPLINARY RESEARCH WORK

Assistant Professor Luis F. Zuluaga became interested in interdisciplinary work very early on in the development of his academic career. As a B.Sc. student in his native country of Colombia, he decided to pursue a double degree in Physics and Electrical Engineering. Afterwards, he obtained a M.Sc. degree in Industrial Engineering that motivated him to pursue a related Ph.D. degree in Operations Research at Carnegie Mellon University (2004). Presently, the majority of Luis' research focuses on interdisciplinary work between Operations Research and areas such as Finance, Electrical Engineering, Chemical Engineering, and Aerospace Engineering. Luis admits, "Interdisciplinary work allows me to take advantage of fundamental results in different areas to make very substantial practical advances. In fact, most, if not all, of the technological advances we see every day are a result of pivotal interdisciplinary research work. This means that there is a stronger connection between research being done and the positive effects it can have in practice. In my particular case, knowing that a company has been able to use some of our work to improve their operations and/or client satisfaction adds extra satisfaction for the work done."

Currently, Luis works on interdisciplinary research between Operations Research and Chemical Engineering in collaboration with Air Products, thanks to funding from the Pennsylvania Infrastructure Technological Alliance (PITA). The main purpose of the work is to find the most efficient (in terms of costs, safety, and environmental impact) way to produce and deliver essential chemicals to hospitals and other industries. For this purpose, it is key to take into account both the physical and chemical properties of the products being produced. In the area of electrical engineering, Luis is working, in collaboration with professors from the Integrated Networks for Electricity (INE) Cluster, to develop methodologies that would allow to set prices of energy in a way that encourages the penetration of renewable energy sources (like wind, solar, and wave energy) in the energy market. This work is key to combine fundamental knowledge from operations research, electrical engineering, and economy, in order to develop these novel methodologies. In the future, Luis expects that this work will greatly contribute to the leading research already being conducted at Lehigh University in the area of Smart Cities, which will affect the way in which cities will continue to be developed, making them more environmentally friendly, safer, and in general, better-designed to improve the life of their residents.

Furthermore, in collaboration with ISE Department Chair, Tamás Terlaky, and the Aerospace Engineering Department at University of Michigan, Luis is looking into the exciting area of airplane wing design with the use of state-of-the-art composite materials. This work is funded by the Air Force Office of Scientific Research (AFOSR). Its purpose is to expand beyond current design methodologies to make full use of current technologies, designing safer and more efficient aircraft wings. Lastly, another area of interdisciplinary research work that interests Luis is financial optimization, where he looks at methodologies to obtain both asset portfolios and derivative instrument's prices when information about the assets' return distribution is not known precisely. This experience has made Luis a natural collaborator in the Master of Science in Analytical Finance (MSAF) offered at Lehigh University. Starting this academic year, his involvement with the program will continue growing as he becomes the new Co-Director of the MSAF program in representation of the Industrial and Systems Engineering (ISE) Department.

When asked what will be needed to successfully carry out such varied interdisciplinary work, Luis explains, "First, you need a department like ISE where interdisciplinary work is not only accepted, but highly encouraged, and where the earlier successes in building and carrying out interdisciplinary work lead to opportunities for interdisciplinary collaboration to come up in an organic way. Once the opportunities are present, it's a matter of being motivated to learn, discuss, and creatively work with concepts from fields that might be beyond one's main area of expertise."





BORIS DEFOURNY WINS NSF AWARD FOR FLEXIBLE ENERGY RESOURCES COORDINATION STUDY

ISE Assistant Professor, Boris Defourny [http://www.lehigh.edu/ defourny/], wants to create economic and technical conditions to absorb more energy from renewables and support a larger number of bilateral energy transactions. He recently received support from the NSF for a project entitled, "A Nonbinding Commitment Modeling and Control for Deployment of Distributed Flexible Energy Resources."

Recent technological advances have made it possible to produce electrical power locally, from renewable energy resources such as wind and solar, and to store it more efficiently. However, the power grid can only absorb as much power as what was predicted to be produced, and has reached limits in the power from renewables that it can reliably schedule in advance. Going further will necessitate more capabilities for sustaining imbalances in power production and consumption. Here is the point where storage technologies and demand flexibility have a role to play, but today's electricity markets carry obligations that are risky for small participants, and payoffs that do not fully reflect their contributions to the operability of the power grid under higher levels of renewable energy.

"Today's economic and control techniques are insufficient to create a 'network effect' that is needed to deploy flexible resources at the level of the distribution grid and support energy transactions," says Boris Defourny.

The project will pursue stochastic control research to coordinate flexible energy resources connected to the grid, and to study compensation mechanisms to attract a large number of small participants. "Another attractive feature of the project is that the advances in theory and algorithms will also be widely applicable to other distributed systems," says Boris Defourny. "In that sense it greatly reflects the philosophy of Lehigh's Integrated Networks for Electricity Research Cluster (INE), whose results are relevant to the design of future interconnected systems in general."



TED RALPHS is spending his sabbatical year (2016-2017) is Berlin, Germany as a guest researcher at the Zuse Institute Berlin (www. zib.de), an interdisciplinary research institute for applied mathematics and data-intensive high-performance computing on the campus of the Free University of Berlin. Ted will be affiliated with Research Campus MODAL (Mathematical Optimization and Data Analysis Laboratory) and will be partnering with ZIB researchers on a range of projects, including GasLab, a long-term research effort aimed at optimizing the gas transport delivery network in Germany.



KATYA SCHEINBERG is spending

her sabbatical year (2016-2017) at Google Research, NY and the University of Oxford. At Google she will be working with the machine learning research team on improving optimization algorithms for deep learning tools and other large scale learning algorithms. At Oxford she will be joining the Mathematical Institute as a visiting faculty as well as Balliol and Exeter Colleges as a visiting Fellow. She will also hold a part time visiting position at the new Alan Turing Institute in London. While in the UK, she will be pursuing research on advanced optimization methods for stochastic optimization.



ALBERTO LAMADRID, an

Assistant Professor in the College of Business and Economics, joined the ISE Department as an affiliated member. Alberto has a Ph.D. for Applied Economics and Management from Cornell University. He is collaborating with several ISE faculty members in the frame of the INE Cluster.

TERLAKY NAMED A FELLOW FOR INFORMS

Tamás Terlaky, George N. and Soteria Kledaras '87 Endowed Chair Professor and Chair of Lehigh's Industrial and Systems Engineering Department, was elected as a Fellow of the Institute for Operations Research and the Management Sciences (INFORMS).

INFORMS Fellows are examples of outstanding lifetime achievement in operations research and the management sciences who have demonstrated exceptional accomplishments, making significant contributions to the advancement of OR/MS over a period of time. Their outstanding scientific achievements and service to the profession and to INFORMS has culminated in election to the INFORMS Fellow Award.

Terlaky, among the most accomplished experts of optimization, has made fundamental contributions to the theory, algorithms, computational methodology, and applications of optimization, carrying an exemplary track record of mentorship and distinguished service to the INFORMS community. At INFORMS, among other functions, he served as the Chair of the INFORMS

Optimization Society (2005—2006) and Chair Elect (2004). The Optimization Society saw a significant increase in membership over this period, elevating the subdivision from a section to a society. New prizes were also introduced, including the Young Researcher, Farkas and Khachiyan awards, as well as the creation of the Optimization Society conference series.

Terlaky also was an inaugural member of INFORMS' Subdivision Council and the Sections and Societies Subcommittee from 2005 to 2007.

Last year, he served as General Chair of the INFORMS 2015 Annual Meeting in Philadelphia, where Lehigh's 150th anniversary was featured. Since 2005, Terlaky has also been a Fellow of the Fields Institute and Honorary Founding Editor-in-Chief of the Journal Optimization and Engineering. In 2015, he received the Award of Merit from the Canadian Operations Research Society.



2016 ISE DISTINGUISHED ALUMNI AWARDS SPRING 2016 SPENCER C. SCHANTZ LECTURERS

The ISE Department was honored to have not one, but two Spencer C. Schantz Lecturers during the Spring semester. While Dr. Ronald Askin '75 and Richard R. Verma '90 were at Lehigh to receive their ISE Distinguished Alumni Awards, they split the duties of the Spencer C. Schantz Technical Talk and Public Lecture.

While Ronald delivered his Technical Talk on "Industrial Engineering: Key Principles and Paradigms Developed to Date and the Opportunities and Challenges for the Future," Richard gave his Public Lecture on "Technology, Innovation and American Diplomacy in the 21st Century."

DR. RONALD G. ASKIN '75

Ronald G. Askin is Professor of Industrial Engineering at Arizona State University. He received a BS in Industrial Engineering from Lehigh University, an MS in Operations Research from Georgia Institute of Technology and a Ph.D. in Industrial and Systems Engineering from Georgia Institute of Technology.

At a very young age, Ron learned he had a knack for math and science. With this in mind and the influence of a close family friend, Ronald decided to apply to Lehigh. He began as a chemical engineering and math major, but during a freshman simulation class he learned he was more interested in industrial engineering. Ronald notes, "Students come into a university not knowing what industrial engineering is. I learned quickly that IE is learning how to do things better. I wanted to do things better too."

Ron credits his success to the faculty and education he received at Lehigh. "They cared about their students and had great stories. They prepared us to be professionals." In particular he remembers Wally Richardson who encouraged him and taught him the practical side of engineering, and Gary Whitehouse who sparked his interest and excitement in operations research.

Outside of his studies, Ron played tennis, basketball and badminton at Lehigh. While reminiscing, he recalls an instance during his 8 a.m. Saturday Psychics Lab when he blew out the fuses, killing all the power to the building. He still chuckles at the thought of it. Ron met his wife, Jackie, during his sophomore year and her freshman year. Although meeting years before, they only started dating Jackie's third (final) year and Ron's senior year. Ron notes, "Jackie was not only one of the first females to graduate from Lehigh, but she graduated with

two degrees (English & Psychology) in three years." When graduation was on the brink, Ron's job offer from Armstrong Corporation was one of many that was cancelled due to the economic downturn. Ron admits, "I became a grad student by chance." After the cancellation, he enrolled in grad school at Georgia Institute of Technology in pursuit of an MS in Operations Research. After one year of Georgia Tech, Jackie and Ron married in Lehigh's Packer Memorial Chapel. With the guarantee of full funding, Ronald continued at Georgia Tech, picking up a Ph.D. in Industrial and Systems Engineering.

After Georgia Tech, Ron was an Assistant and then Associate Professor at the University of Iowa. He then went to the University of Arizona as an Associate Professor and eventually became a Professor and



Department Head. Ron's current position is at Arizona State University as a Professor. He recently stepped down from his responsibilities as Director of the School of Computing, Informatics, and Decision Systems Engineering to have more time for teaching and research. Throughout his career, Askin has received an impressive number of awards and honors. He was elected Fellow of the Institute of Industrial Engineers in 1995, received the Shingo Prize for Excellence in Manufacturing Research in 1994, and won the National Science Foundation's Presidential Young Investigator Award in 1984. He has received several Best Paper Awards and twice received the IIE Book-ofthe-Year Award. In 2012, he served as general chair of one of the largest and most important professional society meetings in his discipline — the Institute for Operations Research and Management Science (INFORMS) annual meeting.

When asked to give advice to current students, Ron says, "Figure out what faculty members want you to know. Going to class is a perfect example of this. Your professor is there to highlight what is most important in your book, and to help you understand it. So, take full advantage of that!"

Currently, Ron teaches one class a semester at Arizona State University. His favorite part about his position is meeting and working with seniors and grad students one-on-one or in small groups. In this capacity, he's able to receive feedback on what the students are grasping, if the speed of teaching is too fast or too slow, etc.

As far as teaching, Ron believes he'll continue for a couple more years. Jackie, who retired in 2015 as Vice President of Administrative Services at Chandler-Gilbert Community College, now telecommutes to the National Association of College and University Business Officers (NACUBO) in Washington where she directs the higher education economic models project. The two both enjoy traveling and hope to do more of it in the near future.

*Jackie and Ron have two children who live in California; a daughter (33) who is an engineer and a son (35) who is a lawyer.

RICHARD VERMA '90

Ambassador Richard Verma freely admits, "Industrial Engineering did not come naturally to me. I was challenged every day; it was a real workout. The training, the regimen and the rigor at Lehigh are hard to find at other places."

With this in mind, Verma began his public lecture with loving words for his alma mater. "I love coming back here. I owe this institution a lot. I knew next to nothing when I arrived here in August 1986 and somehow this place helped set me on the right track. For someone from very modest means, going to school here was an awfully enriching and rewarding experience."

Richard attended Lehigh on an Air Force ROTC scholarship and was subsequently commissioned as a second lieutenant. He served as Senior Class President, developing lifelong friendships during this period. "When I was sworn in at the State Department as the United States Ambassador to India, there in the crowd were countless Lehigh friends from 26 years ago. It was as if not a day had passed since we were here, a true testament to the lasting bonds we formed at Lehigh," Verma says.

Although immensely honored to deliver the Spencer C. Schantz Lecture and receive the Lehigh ISE Distinguished Alumni Award in Industry, Verma admits, "If GPA was the determining factor, well then I certainly shouldn't be here!"

Verma admits that the path from engineering to diplomacy might seem like an odd transition, but in Delhi that's not the case. "In Delhi, I'm not such an odd duck – a great share of diplomats, when you read their resumes, have graduated from India's great technical institutes, having studied engineering or the hard sciences." Verma believes the analytical and problem-solving skills one learns throughout the process are immensely valuable. As Ambassador, Verma stresses the importance of science and technology whenever he can. During his public lecture entitled, "Technology, Innovation and American Diplomacy in the 21st Century," Verma spoke about the relationship between the world's two largest democracies. "The United States and India are naturally compatible in many areas. In our bilateral relationship, we need to take two tracks: the track of diplomacy and international relations and the track of science and technology, and try to blend them together."

Verma says, "The most important relationship in the 21st century is between India and the United States. India has a lot to learn from the U.S. and vice versa. Both are incredibly innovative societies." Verma has visited over 50 Indian towns and cities in 21 states in the last 18 months, which has enabled him to see firsthand U.S.-India cooperation.

When asked what course impacted Verma the most at Lehigh, Richard explains, "I remember more of the professors than specific courses. I do know that Professor Robert Storer had a major impact on me. Each week and month, throughout the courses, I received more and more keys to unlock doors. Things finally clicked."

As far as advice goes to current students, Verma says, "Don't be afraid to ask questions and get help. And don't get frustrated if you feel like you are the only one not picking up the material or a new concept. We all have different strengths. The professors at Lehigh are great at working with students who need a deeper dive. I'm a perfect example of this."

Around 250 Lehigh students, faculty members and staff packed Neville Auditorium on April 28th to hear Richard's public lecture. In the evening, around 125 ISE faculty, staff and students joined together at Wood Dining Room for the annual ISE Banquet where Richard and Dr. Ronald Askin received ISE Distinguished Alumni Awards.



ISE DEPARTMENT ANNUAL BANQUET



ISE Ph.D. students assemble one last time to celebrate the closing to the academic year.

Amanda Schmitt '07G, '08 Ph.D., presents Seniors Danielle Heymann, Royce Kok and Aaron Zacharia with MIT Supply Chain Excellence Awards.



ISE Distinguished Alumni Award recipient Dr. Ronald Askin, chats with Professor Robert Storer and ISE Advisory Council Chair, Ray Hoving during the banquet.



ISE Faculty Member of the Year Award (Ph.D.) to Frank Curtis, pictured with Ph.D. Student, Wei Xia.





Student ISE banquet attendees gather for a group shot after the annual banquet.

BANQUET

Tamás Terlaky presents the IBE-ISE/

Financial Engineering Sophomore of

Tamás Terlaky presents the ISE Sophomore of the Year Award to Stephanie Stieber.



Tamás Terlaky presents the ISE Master's Student of the Year Award to Daniel Wolbert.



McGarrigle accepts her ISE Junior of the Year Award from Tamás Terlaky during the awards ceremony.

Elizabeth



Suresh Bolusani is pleased to be named the 2016 Ph.D. Student of the Year.

the Year Award to David Morency.







Tamás Terlaky presents the IE, ISE or Info. Systems Senior of the Year Award to Sean Byrne.





ISE Faculty Member of the Year Award (Master's) to Eugene Perevalov, pictured with Master's student, Thadeus Minthorn.





DAVID MORENCY major: IBE FINANCE & ISE graduation date: MAY 2018



KERI MCGLOTHLIN major: ISE graduation date: JANUARY 2017

What internships have you had?

Last year, I worked at Philips Lighting's global R&D center in Shanghai, China. I focused on product marketing for their LED driver & module lines. This year, I worked in Israel as an analyst for Grove Ventures - an early stage venture capital fund managed by Dov Moran, the inventor of the USB.

What is something that ISE has taught you?

ISE has taught me how to reduce complex processes into smaller, more manageable tasks. Understanding this concept and having practice with it is liberating – it makes it possible to dream big.

Where do you see yourself after graduation?

I will continue seeking learning opportunities that will allow me to further my passions in business, engineering, globalization, and entrepreneurship. As I grow, I will find the best path to unite these interests.

What do you hope to achieve throughout college?

I am grateful for the experiences and opportunities that have been made available to me by alumni, professors, and my peers. I hope to repay their kindness and carry on Lehigh's culture of giving by providing opportunities for new students to challenge their world view, build diverse networks, and pursue lofty goals.

What are you most proud of?

I am most proud of being a part of teams that take on challenging projects with the aim of driving significant, positive change. One example would be Lehigh University's hackathon – LehighHacks. In the Spring semester of 2016, I worked with a huge team of students, faculty, staff, and business leaders to launch the very first LehighHacks. It was an incredible event that united our community in pushing the boundaries of innovation and entrepreneurship. I think it will become a tradition at Lehigh and promote a culture that embraces the cutting edge of technology and business.

Did you have an internship this past summer?

I interned with a Big 4 Accounting Firm in Management Consulting. I was based out of the New York City office, but I was on the client site, a Global Pharmaceutical Company. At the client site I was helping a smaller team of five to consult on how this company was going to serialize their pharmaceuticals. I was also able to work internally at the firm in a project management role where I was able to update and create their externally facing websites for the service lines within the Life Sciences sector of the department.

What are your plans for after graduation?

I am currently deciding what would be the best path for me after I graduate as I have a few different options. I have the possibility of pursuing a masters at Lehigh as a part of the Presidential Scholarship as I have been accepted into this program, (contingent upon my grades this coming semester). I am also considering going directly into consulting.

What was it like to be on the ISE Student Council?

I greatly enjoyed my time on the ISE Student Council. I felt more connected than I had ever been to the department and wanted to connect the other students that were in ISE to what the department had to offer. The part of the Council that I enjoyed the most was being able to connect directly with some members of the ISE Advisory Council. I was actually able to connect with one member in particular who I am still in touch with and was able to offer me very helpful advice.

What is your favorite part about the department or favorite memory?

I have a few different favorite memories including the Spencer Schantz Lectures, the professors and the ISE banquets. My favorite memory though would be a trip I was able to take as a part of the department. A group of students were able to visit four different companies in New York City and connect with people that work there. This was an information-packed day that was a nice break from classes and ended with a department alumni event.



MIAO BAI major: IE PH.D. STUDENT graduation date: DECEMBER 2016 (EXPECTED)

What classes do/did you teach and what do you enjoy most about teaching?

I am the lab instructor for ISE 132 and ISE 216. I taught ISE 215 (during summer session) in 2012 and 2013. I enjoy helping students learn new things. I feel very accomplished when explaining a complicated or abstract concept to students in a simple, but effective way. Associate Dean (RCEAS), Greg Tonkay, has shared a lot of personal experience to help me improve my teaching skills. Also, feedback from students motivates me to do better.

What kind of research are you working on?

I am doing research with Professor Robert Storer and Professor Greg Tonkay. My research involves applying stochastic programming to scheduling problems in health care; particularly in operating rooms in hospitals. While many studies consider the operating room in isolation, an open challenge is to integrate downstream resources in hospitals, particularly the Post Anesthesia Care Unit (PACU) into the operation room scheduling. I have tackled this important problem and developed sophisticated optimization methodologies for dealing with it.

Can you describe your latest internship and what your responsibilities were?

I worked in the Airline Solutions Operations Research group at Sabre. My task was to research and prototype new features in schedule recovery products at Sabre. I'd like to mention that the research capability and all the skills that Professor Storer and Professor Tonkay helped me develop, prepared me for my internship. For that, I'm very appreciative!

What are your plans for the future?

I have not made up my mind about the future. All I know is that I will conduct research, for sure, because that is what I love to do!



MOHAMMAD SHAHABSAFA major: IE PH.D. STUDENT graduation date: DECEMBER 2017 (EXPECTED)

What kind of research are you doing? Who are you working with?

I am currently working on two different projects. One is Optimal Airplane Wing Design, in which we develop a variety of models for the airplane wing design problem and try to numerically solve the models developed. In this project, I am working with my advisor, Professor Tamás Terlaky. Further, Professor Luis Zuluaga and fellow Ph.D. student, Ali Mohammad Nezhad, from our department, and a faculty member of the Aerospace Engineering Department at the University of Michigan, and his Ph.D. student, Sicheng He, also participate in the project.

Also, I am working on the Inmate Assignment Project in which the goal is to develop a mathematical model for the optimal assignment of the inmates of the Pennsylvania State Department of Corrections to the correctional facilities. I am working with Professor Tamás Terlaky, Professor Louis Plebani, Professor George Wilson, and Chaitanya Gudapati, a Master student of our department.

What would you like to do once you graduate? Does it relate to your research? My first priority is to get a Postdoc position and pursue conducting research in the area I am currently working on. Additionally, I will be looking for the jobs in the industry.

What made you choose Lehigh?

Faculty members of the department were one of the most important factors. We have a group of faculty members working on different areas of the optimization theory in our department.

student check-in

PH.D. STUDENT, MATT MENICKELLY, TALKS RESEARCH, LEHIGH AND THE FUTURE

This Fall, Matt Menickelly, enters his fifth (and possibly final) year as a Ph.D. student in the ISE Department. Matt's research, best broadly classified as nonlinear optimization, is a subset of mathematical optimization. Matt explains, "Nonlinear optimization is an important subject for formulating and solving a rich class of mathematical models. It has drawn a lot of attention in recent years because of its applicability in the "hot" topic of machine learning." At Lehigh, Matt is a member of the OptML (Optimization and Machine Learning) research group directed by Dr. Katya Scheinberg, Dr. Frank Curtis, and Dr. Martin Takac. The group and the meetings allow for students to obtain different perspectives on each other's work, allowing each and every member (of

WHY LEHIGH?

After earning a Master's degree in mathematics from Miami University (Ohio), Matt knew he wanted to pursue a Ph.D. in mathematical optimization. More importantly, he wanted to develop his theoretical knowledge base into something practical that would make him eventually hirable, possibly outside of academia. "In this sense, Lehigh ISE is a great place for me! We have a core of faculty with strengths in the theory of mathematical optimization that interests me, but the department is true to its more practical roots as an engineering department. There is never a moment I regret my decision to join Lehigh ISE," Matt admits. "I have met so many great people who I will hopefully consider among my colleagues for life, and I am constantly inspired by their achievements and insights."

INTERNSHIP

During the summer, Matt interned at IBM's TJ Watson Research Center in Yorktown Heights, NY. Matt explains, "It was a very interesting and educational experience. I was able to apply techniques of computational optimization that I studied at Lehigh, to solve real-world machine learning problems brought to IBM by clients from different sectors of industry, including automobiles and computer hardware." Matt will continue his internship at IBM TJ Watson Research Center during the Fall semester.

WHAT'S NEXT?

As for the future, Matt will be yet another student submitting dozens of job applications. When asked what he specifically is looking for, Matt answers, "I'll be looking for jobs in corporate research (like IBM, where I am now, which would be a dream job), government agencies, and perhaps even a few postdoctoral programs. All I know is that I'm excited to see where life takes me next!"

different backgrounds) to bring something unique to the table. "When you do research in any field, it's very easy to focus only on the narrow scope of your own problems that you lose sight of the forest for the trees. Listening to other people talk about their research opens your mind to new possibilities," says Matt. "For example, in one project I'm working on at IBM, I'm dealing with something called 'Gaussian graphical models.' This is totally independent from my Ph.D. thesis, but through OptML, I had interacted with a couple of my colleagues and their work in this subject. As a result, I wasn't completely lost when I first started working with Gaussian graphical models a few months ago."





Tamás Terlaky presents, Senior, Joshua Koshy with the Lawrence E. White '64, '65G, '69 Ph.D. Fellowship for Master of Management Sceience and Engineering at the annual ISE Banquet.

LAWRENCE E. WHITE FELLOWSHIP RECIPIENT

The Industrial and Systems Engineering Department was pleased to present the Lawrence E. White '64, '65 G, '69 Ph.D. Fellowship for Master of Management Science and Engineering to Joshua Koshy at the annual ISE Banquet in April. The scholarship, made possible by the generosity of Lehigh and department alumnus, Lawrence E. White ('64, '65 G, '69 Ph.D.) provides full tuition support toward 30 credits of master's degree study.

Lawrence E. White earned a bachelor's degree in engineering from Lehigh in 1964, followed by a master's degree in Management Science in 1965 and a Ph.D. in Industrial Engineering in 1969. While a student, White was a member of the wrestling team and Theta Delta Chi.

White has long supported initiatives at Lehigh, and is a member of the Asa Packer Society and Tower Society.



In April, Fellowship recipient, Joshua Koshy, got the chance to meet with Larry White.



Ph.D. student, Miao Bai, accepts The Van Hoesen Family Best Publication Award at the department's annual banquet.

THE VAN HOESEN FAMILY BEST PUBLICATION AWARD

The ISE Department was pleased to announce the winner of the second annual Van Hoesen Family Best Publication Competition at the 2016 ISE Banquet. This year's winner was Ph.D. student, Miao Bai, and Honorable Mention went to Ali Mohammad Nezhad. This competition was made possible due to an extremely generous gift from the Van Hoesen family.

Two years ago, Everett Van Hoesen '55 was the recipient of the 2014 Distinguished Alumni Award in Industry. Everett and his family of almost ten Lehigh graduates, created the competition, which is open to all ISE Department students.

We congratulate Miao Bai on winning the award and the \$1,000 prize.



Ph.D. student, Ali Mohammad Nezhad, accepts his award for Honorable Mention.

ADVISORY

As we say goodbye to six ISE Advisory Council members...



RAY GLEMSER '83, '84G, '91 PH.D. President Glemser Technologies Corporation



LANE JORGENSEN '64, '65G President Stonebridge Group, LLC



RAVI KULASEKARAN '88G

Founder, Colabus CEO, Stridus



RAY PRESSBURGER

Managing Director Accenture



CHARLES SEARIGHT

'73, '74G Managing Partner at Vector Growth Partners Managing Director at Blue Ridge Partners



RAY TRAKIMAS '76 '77 MBA VP - Partner IBM

...we welcome our six



J. ROBERT BAUM '64 UNIVERSITY OF MARYLAND HIGHMARK

Dr. J. Robert Baum is Past Chairman of the Board of Highmark, Inc. and Highmark Health and the former owner/ CEO of Ivan C. Dutterer, Inc, Hanover, PA and ICD Woodworks, Manassas, Va., manufacturers of architectural woodwork.

Over 18 years, the companies completed award winning projects at the White House, Universities of Maryland and Virginia, National Cathedral, and Pennsylvania Capital. Baum founded two companies (uniform manufacturing and chandelier manufacturing) and created two rollups (wood products and uniform rental). He completed the sale of his last company in 1999 and is a private equity investor in 5 businesses.

Dr. Baum is a Lehigh University Industrial Engineer. He graduated first in his Northwestern University MBA class with majors in Finance and Economics. He received his Ph.D. in Management and Organization from the University of Maryland in 1994. Dr. Baum taught new venture creation and financing and won six university teaching awards.

Dr. Baum is Professor Emeritus of Management and Organization at the University of Maryland. He was the Director of Entrepreneurship Research and Academic Programs in Entrepreneurship since 1999.

He was the 2013 recipient of Lehigh University's Industrial and Systems Engineering Distinguished Alumni Award.

He is the widower of Jo Ann Baum, the father of 4 children, and he has 8 grandchildren.



DAVID C. BURDAKIN '77 JBT CORPORATION

David Burdakin joined JBT as a Vice President and Division Manager of JBT AeroTech in January 2014 and was appointed Executive Vice President and President of JBT AeroTech in May 2014.

David has over 30 years of experience in industrial manufacturing and executive

leadership, and has led Lean transformations at three different businesses. Prior to joining JBT, he was an independent consultant and the Non-Executive Chairman of Mayline Corporation, a private equity owned industrial company. From 2007 to 2012, he was the President and Chief Executive Officer of Paladin Brands, a leading manufacturer of attachment tools for construction equipment. Following the sale of Paladin by Dover Corporation in late 2011, he worked for the new private equity owners during a transition period and then rejoined Dover Corporation on contract as an independent consultant. Prior to Paladin, he progressed through various leadership roles at HNI Corporation (1993 to 2007), including seven years as President of The HON Company, HNI's largest operating company. Before joining HNI, he held various roles at Illinois Tool Works and Bendix Industrial Group.

From 2002-2008, Mr. Burdakin also served as Director, Wabash National Corporation, a NYSE industrial company and was elected Lead Director in 2006.

Mr. Burdakin holds an MBA from Stanford University Graduate School of Business and a Bachelor's degree in Industrial Engineering from Lehigh University.

new Advisory Council members.



UDEY CHAUDHRY '89G

Udey Chaudhry is an Executive Management Consultant, with extensive experience as a Business Strategy Consultant with top tier consulting firms and successful startups. He is an alumnus of Lehigh University (MSE program) and MIT Sloan School of

Management. He has over 20 years of experience that includes advising senior (C-Level) client executives, developing Business and IT strategies, performing Financial Analysis, and launching new products. He has helped corporations in setting their Vision, Mission and Strategic goals. Udey currently works for IBM Global Business Services.

Udey has helped clients with improving their Revenues, reducing Operating Costs, improving Efficiencies, and meeting Regulatory/ Compliance requirements. He has extensive experience with digital technologies such as Cloud Computing, Business Analytics, Mobile, and Social media and helped clients achieve their corporate goals by leveraging digital technologies.

Udey currently serves on the Board of a not for profit, Financial Institution (Meriwest Credit Union), with assets over \$1.3 Billion, as the associate director. The mission of the credit union is to serve the underserved individuals within the San Francisco/Silicon Valley community and also help entrepreneurs/small business owners achieve their dreams.

Additionally, Udey volunteers at a local school to help kids with their Robotics program and get them interested in Science, Technology, Engineering and Mathematics (STEM).



CHRISTIAN T. RIEMANN '87 IBM

Chris Riemann is a partner in IBM's consulting division and leads IBM's Digital Operations and IoT (Internet of Things) practice for retail, CPG, life sciences and travel/transportation. He has over twenty five years experience in supply chain management for retail and consumer product companies,

both in consulting and industry, and has worked on multiple projects in the following areas: Warehouse Management System (WMS) design and implementation, RFID evaluation and design, supply chain transformation strategy, cognitive analytics and forecasting, logistics cost reduction (distribution and transportation), DC optimization, and import and domestic transportation systems and management. Prior to joining IBM (then Price Waterhouse) in 1995, Chris was the international and domestic transportation manager for Venture Stores and Industrial Engineering Manager for J. Crew. Chris has spoken at more than twenty industry conference on IoT and has contributed to multiple white papers on the subject.

Chris graduated with honors from Lehigh University in 1987 with a BS in Industrial Engineering. He was a member of Alpha Pi Mu (IE Honor Society) and Kappa Alpha. He is also a US Licensed Customs Broker and in his free time he enjoys running (10 marathons to date), biking, fishing, and woodworking.



DANIEL J. SCANSAROLI '05, '06G, '09G, '12 PH.D. J.P. MORGAN

Dr. Daniel J. Scansaroli holds several degrees from Lehigh University, including a doctorate in Industrial Engineering (2012), a M.S. in Management Science (2009), a M.S. in Applied Mathematics (2006), and a B.S. in Mechanical Engineering (2005). His doctoral

research focused on Financial Engineering & Stochastics, where he improved techniques for statistical forecasting, risk measurement, horizon based portfolio construction, and derivative pricing when investment assets possess mean reversion or temporal dependence/momentum. He has presented at distinguished conferences, including the Institute for Operations Research and Management Science (INFORMS), and Modeling and Optimization: Theory and Applications (MOPTA).

Dr. Scansaroli is currently an Executive Director J.P. Morgan Asset Management where he serves as Head of Quantitative Research for the Private Bank, which is responsible for the development of investment strategies and portfolio management of high-net-worth and institutional client assets.

Prior to joining J.P. Morgan in 2012, Dr. Scansaroli was employed by Lehigh University's Endowment. He has also worked as a lead Process Management Consultant in Lehigh's Enterprise Systems Center, a Teaching Assistant for Lehigh's Integrated Business and Engineering program, and an Analyst at Rothschild's M&A and Restructuring division.

Dr. Scansaroli, his wife (Dr. Jennifer Elliott, class of 2005), and daughter live in New York.



RICHARD WASCH '71, '73G RETIRED - ACCENTURE

Richard graduated from Lehigh with a B.S. in Industrial Engineering, with High Honors, in 1971 and a M.S. in Management Science in 1973. He retired after 30 years delivering business performance and process improvement with Accenture (Consulting and Operations). He was a partner / senior

executive in New York and Ireland and worked with a diverse group of financial service clients.

When colleagues ask what he does in retirement, Rich says, "I am not working for a paycheck but am as active and energetic as ever." Rich serves the community in various voluntary leadership roles protecting the environment and advocating for social, political and ethical responsibility / action. He travels frequently, takes courses at University of North Carolina - Asheville, enjoys a variety of sports and fitness activities and time with extended family.

Rich resides in Asheville, NC with his wife Karen. Between them, they have four children.

Strauch Family

For decades, Lehigh and the ISE department have seen many members of the same families come across campus. Fathers, sons, mothers, daughters, brothers, sisters, 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 is dedicated to ISE legacy families and the impact that the department and Lehigh have made on their lives. Four generations of the Strauch family have attended Lehigh University. First came Charles C. Strauch '22, (ME), then Harry C. "Carter" Strauch '55 (IE), Charles S. Strauch '57 (IE), Mark S. Strauch '92 (IE), Stormont R. Mahoney '15, '16 (IBE/ISE) and Liam H. Mahoney '19 (IBE/ISE). To make this simpler, Charles C. is the father of Harry "Carter" and Charles S. Strauch. Mark's father is Harry "Carter" and Stormont and Liam are the sons of Charles S.'s daughter, Wendi Strauch Mahoney.



CHARLES C. STRAUCH '22 ME

Born in 1899, he never saw his father who was killed in a railroad accident 3 months before he was born.

He was raised in Pottsville, PA by a single Mom who worked her way up from teller to an officer in a bank. Charles spent one year at New York Military Academy before entering Lehigh University in 1919. He was an All-American and Captain of Lehigh's National Championship Lacrosse team in 1922. His first job was in selling air conditioning and refrigeration in Buffalo, NY for York Corporation. He worked for York his entire 44 year career in Buffalo, Philadelphia, St, Louis, Houston and Los Angeles. Carter and Charles both remember their parents as an extraordinarily well-tuned parenting machine. Their mother ruled the roost with an iron fist idolized by Charles who appreciated his wife's important role in staying home- as she would say – "building men." Charles worked long hours, often on the road and won countless awards, as he would say, "selling ice machines to Eskimos." When he retired in 1966, he continued as a salesman for a York distributor. He simply loved to sell! Charles died in 1979.



HARRY C. STRAUCH '55 IE AKA "CARTER"

Harry "Carter" Strauch grew up with the understanding that his father, Charles C.,

was "Mr. Lehigh." Even as a little boy, Charles S. and Carter went to every Lehigh/Lafayette game and often to EIWA wrestling finals at Grace Hall.

Carter knew he wanted an education in science, so Dartmouth, Princeton and Penn had to yield to Lehigh. "At Lehigh, I was Phi Gamma Delta and played four years of varsity lacrosse, following my Dad's legacy as Captain of the 1921 National Championship team." Carter was also Captain of the cheerleading squad.

Carter joined Leeds & Northrup upon graduation from Lehigh and began graduate work in thermodynamics at Penn. He entered flying training in the USAF in 1959. He returned to Leeds & Northrup and later became President of the Lab Equipment Division. Some years later, he joined Simmonds Precision as President of Wacline in Dayton. After that, he became President of Industrial Products at Schlegel in Rochester, NY and followed that as Group President of several companies at Hexcel in California and Texas. Carter later returned to graduate work in naval architecture. This led to yacht and yacht harbor design work in the San Francisco Bay Area. In 1995, Carter retired as Harbor Master at South Beach Harbor in San Francisco

Carter has four children: Diana, Cindy, Skip and Mark.



CHARLES S. STRAUCH '57 IE

While reminiscing about Lehigh, Charles S. remembers two professors he truly connected with;

Wally Richardson and George Kane. "Think of them as the equivalent to your modern-day Professors Robert Storer and Pat Costa," says Charles. "They were mentors in every sense of the word."

While a Lehigh IE, Charles also participated in several extracurricular activities. He followed in his father's footsteps, playing lacrosse during his sophomore, junior and senior years. He also was a (male) cheerleader and President of Phi Gamma Delta. He remembers George Kane and his wife, Regina, constantly being their house party chaperones.

When he graduated, Charles had a job lined up at Union Carbide, now a subsidiary of Dow Chemical Company. On his first day, Charles found out that he and his boss had both lost their jobs. Although this was a hit to the stomach, Charles' boss set him up with a job in construction. "Here I was a new Lehigh graduate expecting to have a job that required a suit and briefcase. Instead, I was thrown into a Union Carbide hard hat construction job." Charles worked construction for a year and a half and talks about this position fondly. "My boss from Union Carbide made a tremendous impact on my life. "He gave me a real job where I worked daily with experienced, tradesmen who kicked my butt when I screwed up - - allowing me to gain hands-on experience. Everyone should have the chance to start off this way."

After his stint in construction, Charles joined the US Army as a ROTC candidate and then returned to Union Carbide as an industrial engineer in West Virginia. At 27 years old, Charles was promoted to General Manager at a Carbide construction products company in Minnesota. "I was still in a learning mode and couldn't find my rear-end with both hands, let alone run a company," Charles laughs. He then spent the rest of his career taking on similar turnaround roles in technology companies straightening them up or deciding to sell them or shut them down. He served as Chairman and CEO, PairGain Technologies, President and CEO of MSI Data, Chairman/CEO Magnusson Computer Systems, President of Memorex, and Executive Vice President of Gould Inc.'s Electronics and Electrical Systems Group. All were publicly traded companies.

Currently, Charles owns GA Services LLC, Steadfast Construction LLC, and GAS Finance. GA Services provides network installation and maintenance services for retail stores. Steadfast builds commercial and residential docks and sea walls used to protect

ALUMNI

against erosion. But as Charles says, "My greatest joy is GAS Finance. We loan money to small startups that don't qualify for bank loans to help expand their business!" Charles gives an example of a small startup in Owensboro, KY that refurbishes football helmets and shoulder pads. "Many people don't know this, but each year, helmets are required to be sent back to the manufacturer for refurbishment. The service is often non-responsive and expensive. This company competes with the manufacturers in the Southeast region providing superior customer service at a lower price." Charles explains his greatest joy comes in helping young business owners with no working capital to achieve their dream.

Charles and his wife, Nan, are no strangers when it comes to Lehigh gifts. They provided initial funding for Lehigh's pioneering integrated programs in 2003. In 2012, they committed \$1 million to enhance Lehigh's engineering labs and also, helped create an initiative to expand the depth of Lehigh's teaching in computer and data science.

Charles credits Lehigh's hands on, projectoriented, problem-solving teaching approach, which placed a high value on industry relationships, with providing him a leg up in starting his career. "My parents were working hard, making real sacrifices in order to provide me with a high quality education. So, I knew exactly why I was in college – to get good grades and then get a good job"



MARK S. STRAUCH

Mark Strauch admits that the Lehigh family tradition was a big deal to him. "The engineering reputation was

also attractive and the opportunity to play Division 1 athletics was a big draw." Mark was fortunate enough to receive an athletics grant for baseball that made it more affordable for him to attend Lehigh.

Mark was a four-year starter and captain of Lehigh's Varsity Baseball Team. He was Rush and Social Chairman at Phi Gamma Delta and a member of the Tau Beta Pi Honor Society.

After graduation, Mark returned to San Francisco. His first job was with Accenture as a Senior Consultant. Two years later, he moved to Electronic Arts where he designed video game software. He later received his MBA at Kellogg School, Northwestern University, got into investment banking at Broadview, and became President and later, CEO of a software company called Business Engine (London). From 2008-2011, Mark was the President and CEO of a software company called EDC. He currently is a partner in a private equity firm called Alpine Investors.

Mark explains, "My Lehigh engineering degree taught me how to think critically about anything and everything. By virtue of the school's reputation, I gained access to many career opportunities I might not have otherwise have had. As a kid from the West Coast, coming back East to a school of Lehigh's caliber was an opportunity to expand my horizons and grow up as a young man."

Mark has been married for 18 years to his wife, Laurie, and the two have 3 children together (Alex, Carter and Kate).



STORMONT R. MAHONEY '15, '16 IBE/ISE

Stormont "Sto" Mahoney explains, "My grandfather turned my attention towards

Lehigh as a prospective school while I was applying. He was never insistent that I go to Lehigh, but rather opened my eyes to the opportunities and experiences I might have by attending. The decision was mine and mine alone."

During Sto's time at Lehigh, he was a member of Phi Gamma Delta, a Lehigh University Admissions Fellow, a member of the Industrial and Systems Engineering Council, a Teaching Assistant for the Integrated Business & Engineering program and played Club Basketball. Sto received many awards and honors for his impressive academic record, including IBE Sophomore and Junior of the Year Awards, a constant presence on the Dean's List and Lehigh's Presidential Scholarship. Sto admits, "I have always had the undying support of my parents. Their love, commitment, and hard work have put me in such an advantageous position, which was a primary reason why I was motivated to do well in school."

After graduation, with a job secured at Ingersoll Rand (as a Sales Engineer), Sto

egacies

decided to spend the following two months living and traveling abroad. Sto says, "I did intensive research and connected with a Spanish family online who agreed to host me for the summer. Throughout the summer, I'd spend time with the family, teaching the three boys English during the week, and then travel around Europe on the weekends."

Sto credits Lehigh's IBE program for its uniqueness in producing integrated students - those who have propensities for technical knowledge, business savvy, and high interpersonal skills. Sto, who frequently turned to Professor Pat Costa for career advice, admits, "Starting my new role at Ingersoll Rand, I feel incredibly ready to navigate the challenges and hurdles that are standing in the way of my career goals. And if I encounter challenges I can't navigate on my own, I know I can always call upon Professor Costa, Professor Storer, or any of my peers in the program for help." Even though Sto has begun a new chapter, he plans to stay involved with the IBE program because of its enormous impact on his life.



LIAM H. MAHONEY (EXPECTED DATE: '19) IBE/ISE

Liam, who is the youngest member of the Strauch/ Lehigh family, chose Lehigh

for its proven track record in providing excellent education, producing competitive graduates, and tailoring it approach to the individual.

Liam, who is a sophomore, is majoring in Integrated Business and Engineering with a specialty in ISE and a focus in Finance. As far as future plans, Liam says, "I really enjoy research and investment, and feel that my abilities on the mathematics and engineering side would tailor well to a job anywhere from Wall Street to a private equity firm."

Liam is a member of Pi Kappa Alpha and the Spanish Club.

The Strauch family continues to make quite an impact at Lehigh. With Charles' reminder that there are twenty-nine family members, we're sure that the legacy will expand even greater! We are proud to feature the Strauch family in this edition of the ISE newsletter. They truly exemplify the definition of a Lehigh legacy.

LIFE AFTER LEHIGH HSE

PHILLIP BURRELL '15

Phillip Burrell was first introduced to Lehigh's Healthcare Systems Engineering program by a previous Program Director. Phillip explains, "I had just presented at a conference when he and I had an extensive conversation on the U.S. healthcare system. He invited me to learn more about Lehigh's HSE program and its goal in developing healthcare leaders with engineering skillsets." Phillip was so impressed with what he learned about the program that he paid a visit from Texas. His visit confirmed that this was the kind of program that was the perfect fit for him.

Phillip recommends several classes/professors that particularly influenced him during his time at Lehigh, including Design of Experiments with Professor Eugene Perevalov, Optimization with Professor Luis Zuluaga, Sustainable Systems Design with Professor Keith Gardiner and Healthcare Finances with Professor Stuart Paxton. Phillip notes the professors' real-world applications brought to the classroom combined with their passion for the subjects that truly enhanced his experience. "I also can't overstate the influence of Lehigh graduate students, specifically the camaraderie among the students in the HSE program, both on-campus and enrolled in distance learning (DE). Engaging with students from various backgrounds with different interests in applying this education throughout the healthcare industry made the overall experience very rewarding."

As a student, Phillip held the position of President of the HSE Club. In this role, he was able to lead a team that truly wanted to grow its presence in ISE and Lehigh. "As President, I focused efforts between 1) leading integrated health/medical professional workforce and Lehigh student engagements and 2) establishing sustainable practices that could lead to future meaningful healthcare experiences for students and faculty," he says. "We (the club leaders) took a forward-thinking mindset to the club: Build the foundations necessary to make the club sustainable and scalable in the future."

During his second (and final year) in the program, Phillip admits he took a slightly different approach to employment. Instead of spending hours filling out applications to various jobs, he used time he had after work and studying to attend educational events and conferences related to healthcare improvement, engineering in healthcare, healthcare operations management, and healthcare policy. "I focused my efforts on listening to other healthcare professionals in various disciplines. Fortunately, the opportunity I was looking for found me. I applied to the position, interviewed well, and started the opportunity before graduating," he explains.

Phillip is currently working for the Hospital and Healthsystem Association of Pennsylvania (HAP) under the leadership of Andy Carter, President/CEO, Dr. Michael Consuelos, Senior VP for Clinical Integration, and Vice President for Research, Martin Ciccocioppo. HAP is the statewide membership services organization that champions for about 250 Pennsylvania healthcare organizations and the patients and communities they serve in policy development, advocacy, and thought leadership. "I run the Research Division. My team and I have the responsibility of transforming data into actionable intelligence to develop a comprehensive understanding of how policy impacts healthcare in and around our state. We support our members in improving health and wellness in their communities by examining factors that affect the healthcare landscape in Pennsylvania and by providing thought leadership from multiple viewpoints; examining environments regionally and statewide."

Phillip credits the HSE program for preparing him for this position. "I've always approached challenges and opportunities with a system's thinking perspective, but I felt that I had gaps in the necessary KSA's (Knowledge, Skills, and Abilities) to really provide solutions at an optimal level through a sustainable system's approach. The program provided me the didactics and experience to fill-in those gaps with competencies I need to be a successful healthcare leader."

Phillip adds that a great opportunity for working professionals is the Distance Education program at Lehigh. "I was fortunate to start Distance Education and finish on-campus, giving me a well-rounded experience of the program." Phillip credits the DE program as wellstructured, yet flexible for students. "The faculty work with your schedule to make themselves available, providing tremendous guidance and support. It is a great alternative for well-organized, working professionals looking to advance their careers by gaining new skills relevant to all aspects of health and medicine."

As far as advice for prospective students, Phillip says, "Apply! You won't regret it!"



Phillip Burrell accepting the HSE Student of the Year Award at the 2015 ISE Banquet.

HEALTHCARE SYSTEMS ENGINEERING



STUART PAXTON HSE ADJUNCT PROFESSOR

Stuart Paxton assists with student advising and serves as faculty for ISE 472 Financial Management in Healthcare and the project and capstone courses. His expertise is in operations and finance, which

comes in handy both in the classroom and as part of the team overseeing the program.

Stuart explains, "What I most love about the program is its uniqueness. There are only a handful of programs in the country like HSE, which is focused on preparing students to go into the healthcare field to effect change in how organizations function. Students obtain skills in process improvement which will position them to help organizations become efficient and effective in what they do."

Stuart is a seasoned healthcare executive with more than 30 years of experience in operations and finance in hospital settings. He retired as COO of Lehigh Valley Health Network in 2009, and started a management consulting practice, Paxton & Associates, LLC. He also became affiliated with Lehigh University and contributed to the launch and oversight of the Healthcare Systems Engineering (HSE) Program. Mr. Paxton serves on several boards, including Capital BlueCross and Health Network Laboratories and has a BA from the University of Virginia and an MBA from the University of New Hampshire. "Our HSE graduates are hired by a variety of healthcare related organizations, including hospitals, consulting, pharmaceuticals and insurers. Demand for employees with the skills our students are obtaining will only increase over time as the healthcare system undergoes significant change. In particular, the government is dramatically modifying how it pays for services to Medicare patients, leading hospital and physician providers to enhance their productivity and quality."

FLEXSIM HEALTHCARE

Lucien (Lou) Keller, Director of Healthcare Systems Applications, Flexsim Software Products, Inc., gave a two-day Healthcare Simulation Software Training workshop to Lehigh students (August 13-14). Lou, who has been a member of the HSE Industry Advisory Council for five years, has provided this free training at Lehigh on several occasions.

Flexsim Healthcare is a 3D simulation tool that allows you to analyze all of the components to patient outcomes and evaluate the impact they have on your healthcare system, all in a patient-centered virtual environment.

Attendees learned about simulation theory, received software training and completed model building exercises. One student explains, "Because the instructor is very experienced in simulation, he provided excellent context for what we were learning." Another says, "Training was great! The product is very robust and well-assembled. I would/will recommend both FlexSim and the training to colleagues."



TERRY THEMAN, M.D. HSE ADJUNCT PROFESSOR

Terry Theman is a retired cardiothoracic surgeon who "wants to give back to Healthcare." When Terry was close to retiring from active medical practice, he decided to obtain a master's degree in Healthcare

Systems Engineering at Lehigh University. Since then, he has taken an active interest in teaching the project-based courses in the HSE Program at Lehigh as an Adjunct Professor.

"I like to think that my extensive clinical background as a healthcare provider gives me 'inside information' about how complex healthcare systems operate. In addition, I am able to leverage my medical experience and contacts to "open doors" at various institutions. Once we have the interest of the stake-holders in these institutions it is a short distance to obtaining buy-in to the concept of using HSE to improve their healthcare processes. It is because of these contacts that we are able to offer our students a wide range of real-world projects."

Terry says, "I cannot list all of the things that I love about the HSE Program at Lehigh! Two of my favorites include: helping students become skilled at tackling complicated problems, and watching them apply the knowledge and skills that they have acquired."

Terry is co-teaching ISE 474 Healthcare Systems Engineering Capstone Project and ISE 475 Healthcare Systems Project, in the Fall, with HSE Director, Ana Alexandrescu. "Prospective students should know that this program is intense, covering a lot of material over the 30 credit courses. I believe that the student who applies herself/himself will acquire the critical thinking skills (and the engineering tools) to make a real difference to the delivery of healthcare in the USA," says Terry.





MOPTA 2016 CONFERENCE

The ISE department held its 8th annual Modeling and Optimization Theory and Application (MOPTA) conference from August 17-19, 2016, in Rauch Business Center. Dr. Martin Takáč and Dr. Sasha Stolyar co-chaired the conference for the second year in a row and had over 90 contributed talks, both from the academic and industrial field.

MOPTA had seven plenary speakers this year: David Simchi-Levi (MIT), Robert Shorten (University College Dublin and IBM Research), Michael Friedlander (University of British Columbia), Michael Pinedo (Stern Business School, New York University), Gerard Cornuejols (Carnegie Mellon University), Sem Borst (Nokia Bell Lab/Eindhoven University of Technology) and Jacek Gondzio (The University of Edinburgh).

Jacek was the department's first-time Spencer C. Schantz Speaker at MOPTA. Martin Takáč, co-chair of the conference, met Jacek years ago (2010-2014) at the University of Edinburgh. He was Martin's 2nd Ph.D. Advisor. Jacek says, "I was flattered that Martin and the Lehigh ISE Department thought of me in the capacity of the Spencer C. Shantz Distinguished Speaker. I have looked at the list of past speakers and feel honored to join such a group."

Jacek's research focuses on the theory and implementation of largescale optimization methods. His most important contributions came in the area of interior point methods. He had developed cutting plane methods for solving convex optimization problems, and more recently, the new inexpensive second-order methods for optimization problems arising in big data applications.

During Jacek's extended stay, he notes, "I had a very interesting discussion with Martin Takáč and his PhD student, Chenxin Ma, about iterative methods and the design of suitable preconditioners applicable in the context of big data optimization." Jacek adds he had a great conversation with Dr. Tamás Terlaky about his build-up simplex method and its variations re-surfacing the scientific literature under different names. "I also chatted with several Master's and Ph.D. students about conducting research, and our experiences living and working in different countries and different environments," Jacek explains. Jacek notes that working in different countries/environments helps provide a good basis for comparison. "Moving around Europe has an advantage (and an extra difficulty at the same time) of having to learn foreign languages and familiarizing yourself with different cultures," says Jacek. He admits that he has never worked in the U.S., but has visited several U.S. universities for short (a few days) research visits. Jacek shares that that U.S. universities, such as Lehigh, always impress him as "well-organized" work places. He speaks fondly of Lehigh's "modern campus" and notes that the amount of space is enviable, especially in comparison with most European universities. "Lehigh's ISE Department has developed very nicely over the last decade. The strategy to appoint world-class researchers is paying off," Jacek admits. "Lehigh students are lucky to work with such research-active faculty."

Jacek thoroughly enjoyed the MOPTA conference and particularly appreciated the allotted time, allowing for in-depth discussion of new research. "I'd come back for the MOPTA conference with great pleasure," he says. "I valued the many talks and the great balance of theory and practice of OR." He also mentions how Robert Shorten's talk on "Cars and Smarter Cities" was remarkably inspiring.



Jacek Gondzio was the first Spencer C. Schantz Speaker at MOPTA.

LEHIGH ISE AFFINITY GROUP

In our Mid-Year Update in January 2016, we unveiled our Lehigh ISE Affinity Group! We also featured a Q&A piece devoted to explaining the purpose of this group. To view either piece, visit ise. lehigh.edu for past editions of the ISE newsletters.

We launched the affinity group in Spring 2016 with a core group of alumni volunteers from our present and previous ISE Advisory Council. Our goal was and continues to be to promote the relationship and involvement of Lehigh Industrial and Systems Engineering alumni, students and faculty through meaningful events and programs that help advance the professional careers of its members and the academic endeavors of the ISE Department and Lehigh.

OUR OBJECTIVES ARE:

- Networking opportunities for alumni
- Reconnecting to the ISE Department
- Growing support for ISE

In this first year, our goal is to build an active alumni network through networking events, such as lecture luncheons, seminars, webinars, and workshops. We want to hear from you to find out what kinds of events alumni would like to have and which alumni are willing to organize such events.

We know how big of a role social media plays, so we make it our duty to update our Facebook, LinkedIn, and Twitter pages frequently. Please visit our Contact Us page at ise.lehigh.edu to learn how to follow us through social media. Also, we are actively evaluating what social media platform would be the most effective to communicate within the Lehigh ISE Affinity Group. We will let you know the results soon!

To learn more about the Lehigh ISE Affinity Group, visit our website (ise.lehigh.edu). Click on "Affinity Group" in our toolbar and you will find more information on the leadership team, the mission and goals of the group and upcoming events.

TO JOIN THE GROUP, PLEASE EMAIL ABBY BARLOK AT AEB213@LEHIGH.EDU.

ISE DEVELOPMENT

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/giveISE**. If you would like to contribute to the ISE Advanced Computing Technology Endowment, please write "ISE Advanced Computing Technology Endowment" in the "purpose of the gift" box. 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 ISE Department at 610-758- 4050 or terlaky@lehigh.edu.















REUNION WEEKEND

SE



connect

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