

INDUSTRIAL AND SYSTEMS ENGINEERING

NEWSLETTER 2015

150
1865
CELEBRATING LEHIGH



LEHIGH UNIVERSITY

P.C. ROSSIN COLLEGE OF
ENGINEERING AND APPLIED SCIENCE



A few Class of 2015 ISE students pose for the camera after their walking ceremony.

Inside this issue: Page

Fall Spencer Schantz Lecture Series	4
Ana Alexandrescu: New Beginnings in a Familiar Place	5
2015 Distinguished Lecturer, Dr. Egon Balas	6-7
ISE Banquet.....	8-9
2015 ISE Distinguished Alumni, Andy Greenawalt '76G	10
Student Check-in	11
Faculty Update	12
Lehigh OptML Group.....	13
Lehigh Legacies: The Greenawalt Family.....	15
Faculty Highlights.....	16
MOPTA Conference.....	17
Q&A with ISE Affinity Group.....	20
DataX	21
The Van Hoesen Family Best Publication Award.....	22
2015 INFORMS Conference.....	22

ISE Department Newsletter Fall 2015

Department Chair:

Dr. Tamás Terlaky

Associate Chair:

Dr. George Wilson

Editor:

Abby Barlok

Designer

Julie Scheller

ISE Advisory Council

Raymond Hoving '69, '71G – Advisory Council Chair

Raymond Glemser '83, '84G, '91 Ph.D.

Lane Jorgensen '64 '65G

Jennifer Kennedy '02

Ravi Kulasekaran '88G

Jason Lambert '99

Karen LaRoche '88

Kurt Lesker IV '05

Sunil Misser '88G

Scott Nestler '89

Raymond Pressburger '05

Charles Searight '73, '74G

Richard Simek '94, '95G

Kathleen Taylor '87

Raymond Trakimas '76, '77 MBA

ISE Department Staff

Technician and Building Manager

Ed Force

Graduate Coordinator

Rita Frey

Department Coordinator

Kathy Rambo

HSE Coordinator

Linda Wismer

Industrial and Systems Engineering Department

Lehigh University

200 West Packer Avenue

Bethlehem, PA 18015

610-758-4050

Reader Feedback:

Please send comments to editor,

Abby Barlok, at aeb213@lehigh.edu



Dr. Tamás Terlaky
Terlaky@lehigh.edu
610-758-4050

Dear friends,

Greetings! Welcome to the 2015 edition of the ISE department's newsletter! We hope that you thoroughly enjoyed your summer with loved ones and managed to take some time to relax during a vacation or two.

We are very excited to welcome our students back for the 2015-2016 term and look forward to an active year similar to 2014-2015.

As you have probably heard, not only did we get an Interim Dean for the College of Engineering, Daniel Lopresti, on July 1, 2014, but we now gained a new Interim Dean, John Coulter, on July 1, 2015. Professor Coulter has 25 years of teaching and research experience at Lehigh, as well as several years of industrial experience.

In addition, Lehigh University announced John Simon as its 14th President. Simon, who is an internationally renowned chemist and highly respected leader in higher education, brings a lot to the table. We look forward to working with him as a department and welcome the idea that with new people and leadership comes great opportunities.

Our Spring Spencer C. Schantz Lecture Series was unforgettable. Egon Balas, University Professor of Industrial Administration and Applied Mathematics and Thomas Lord Professor of Operations Research at Carnegie Mellon University, drew an impressive crowd not only for his technical talk, but his public lecture as well. Dr. Balas, a well-known mathematician, shared his adventures and suffering under both the Nazis and Communists. To read more about this, see pages 6-7.

At the annual ISE Banquet on April 16, 2015, Andy Greenawalt '76G received the Distinguished Alumni Award for his contributions in industry. Please see page 10 for more information.

As you will see throughout this edition, our students have had many accomplishments during the year and several of our faculty have had promotions. In addition, our faculty and students are actively conducting impressive research, a new HSE Director was hired, and for the fourth year in a row the Enterprise Systems Center and the ISE Department received one of the top honors in the field of operations research as being a 2015 Finalist for the INFORMS UPS George D. Smith Prize. We also are extremely honored to be hosting the INFORMS 2015 conference this year in Philadelphia! Please see the details on page 23 and think about joining us!

Although we have had many new changes university-wide, Mohler Lab's historical details, such as the stained glass windows, remind us of the history of the building and the great thinkers that once filled the hallways. This edition of the newsletter is dedicated to the involvement and kindness of those great thinkers/alumni. We ask that you consider supporting the department either through our ISE Advanced Computing Technology Endowment or as part of our ISE Affinity Group (page 20).

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. I look forward to hearing from you!



Dr. Robert Bixby

Fall 2015 Spencer C. Schantz Lecturer

The ISE Department was honored to have Dr. Robert Bixby as the Fall 2015 Spencer C. Schantz Lecturer at Lehigh University. Dr. Bixby delivered a Public Lecture entitled, "Computational Progress in Linear and Mixed Integer Programming" on Thursday, September 24, 2015 at 3:30 p.m. in the Sinclair Auditorium, 7 Asa Drive.

Professor Bixby has an impressive background in the field of engineering. He received a BS in Industrial Engineering and Operations Research from the University of California, Berkeley (1968), and a PhD in Operations Research from Cornell University (1972). He has held academic positions at the University of Kentucky, Northwestern University, and Rice University, as well as visiting positions at the University of Wisconsin, Cornell University, the Forschungsinstitut für Diskrete Mathematik, Bonn, Universität Augsburg, and the Konrad Zuse Zentrum, Berlin. He is currently the Noah Harding Professor Emeritus of Computational and Applied Mathematics at Rice University, and visiting Professor in the Department of Mathematics at Universität Erlangen. In addition, he is the co-founder (2008) and CEO of Gurobi Optimization.

Dr. Bixby has published over fifty journal articles, and is an acknowledged expert on the computational aspects of linear and integer programming. He has won several awards for his work in optimization, including a Humboldt Senior Scientist award, the Beale-Orchard-Hays Prize of the Mathematical Programming Society, and the INFORMS Impact and Frederick W. Lanchester Prizes. He was Editor-in-Chief Mathematical Programming, Series A, 1989-1994, and Chairman of the Mathematical Programming Society, 2001-2004. In 1997 he was elected to the National Academy of Engineering for his contributions to the theory and practice of optimization. In 2012 he was awarded an honorary doctorate in Mathematics from the University of Waterloo, Ontario, Canada.

Dr. Bixby has over twenty-five years of experience in the optimization software business. He co-founded CPLEX Optimization, Inc., in 1987. CPLEX was acquired by ILOG, Inc., in 1997, after which he served on the ILOG Board of Directors, manager of the ILOG CPLEX Development Team, President of the ILOG Technical Advisory Board, and General Manager of ILOG's Semiconductor Business Division. In 2008, he co-founded GUROBI Optimization.

Spencer C. Schantz Lecture Series

Fall 2015

Dr. Robert Bixby

Public Lecture
"Computational Progress in Linear and
Mixed Integer Programming"

Thursday, September 24, 2015
3:30 p.m.
Sinclair Auditorium
7 Asa Drive
Lehigh University



Ana Alexandrescu: New Beginnings in a Familiar Place

The ISE Department is excited to announce that Ana Alexandrescu is the new Director of the Healthcare Systems Engineering Master's Program. Ana, originally from Romania, came to the U.S. in August 2006, three days before her First-Year Orientation. "Upon my arrival, I met so many nice and helpful people, all excited to meet me and learn about Romania," explains Ana.

It wasn't until Ana met Associate Chair of the ISE Department, Greg Tonkay, now Associate Dean of the College of Engineering, that she decided on what degree she would pursue. "Dr. Tonkay told me about Industrial and Systems, Electrical, and Chemical Engineering. While researching my options, I learned about the Integrated Business and Engineering program and later met with one of the co-directors of the program, Dr. Robert Storer. After that, I got accepted into the IBE program and embarked on my own exciting journey. When I finished my undergraduate degree, I stayed a fifth year as a Presidential Scholar and completed an MS in ISE. This gave me the opportunity to study and build relationships with yet more ISE faculty," adds Ana.

After graduation, Ana worked as a Business Analyst for a boutique consulting firm called Netsoft. Netsoft provides software solutions and product development services to a variety of companies in the healthcare space. Ana worked with clients in insurance and provider and patient engagement spaces performing workflow analysis and design, requirements engineering and business process optimization. Ana also had the opportunity to work with a cross-disciplinary distributed team across the United States and Europe. "In early 2014, we were acquired by a larger software engineering firm, EPAM Systems," explains Ana.

Ana always dreamt about coming back to the ISE Department, but thought the only way possible would be down the road on the ISE Advisory Council. Ana adds, "Then, last year Dr. Terlaky contacted me and mentioned there was an opening for my current position. I went through the interview process, got the job and officially started in mid-March!"

In her new position as Director of HSE, she is also teaching Quality and Process Improvement in Healthcare this semester and Healthcare Information Systems in Spring 2016.

As far as her hopes for the HSE Program, Ana adds, "I hope to develop a reputation for the quality of work and the professionalism of our graduates. I want the program to grow and I want our graduates to engage in all areas and levels in the healthcare industry. With the right mind-set and enough of us out there in the world, healthcare delivery can improve dramatically and people can start getting better care with better outcomes for more sustainable costs."

Since starting in mid-March, Ana has been commuting back and forth from New York City each week. She has now relocated to Bethlehem and recently became a newlywed! When asked about this journey and all these new changes to her life, Ana adds, "This has been quite an eventful half of a year!"



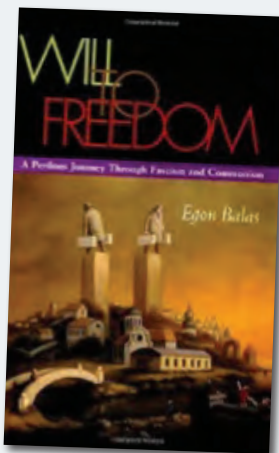
Spring 2015 Spencer Schantz Lecture Series



Dr. Egon Balas

Industrial and Systems Engineering Spring 2015 Distinguished Lecturer

University Professor of Industrial Administration and Applied Mathematics
Thomas Lord Professor of Operations Research



Dr. Egon Balas is not your average mathematician. In fact, when Dr. Balas gave his public lecture at Lehigh University in April, the over packed auditorium was comprised not only of mathematics and engineering students, but history students as well.

Dr. Balas didn't begin his career in the mathematics field until he was 37 years old. "As a high school student, I loved math and physics. I would have become a mathematician or a physicist in the regular way if the war didn't interrupt that."

When World War II broke out, Hitler ran down most of Europe in a few weeks and imposed his odious regime everywhere. Balas, clearly against this, joined the Hungarian Communist Party, and recruited others in attempts to organize resistance. Dodging danger, Egon went into hiding in October 1943. He was later arrested and spent several weeks under interrogation with torture. After Russians took his hometown of Cluj, his captors became uninterested and he was sentenced and sent to jail. This unfortunately would not be Egon's last time in prison.

Egon later met Edith, a survivor of Auschwitz and Bergen-Belsen. After she returned to Cluj, the two were married and had a daughter. Egon, at this time, was a promising young diplomat working in Foreign Affairs. It wasn't until 1952 when Egon had fallen from favor with Romania's Communist regime, that he was arrested yet again.

"I was interrogated without interruption for four weeks," explains Egon. "All they wanted from me was a false confession. I was told there were only two ways out; by execution or a jail sentence." Egon was held captive, in his 8x14 foot cell, for two years and three months. Reading was prohibited along with writing, speaking and exercising. "The only time you could sleep was from 10:00 p.m. to 5:00 a.m. and on most nights that would be the time for interrogation." Egon says he spent his time, when not under interrogation, repeating everything he had ever learned and trying to remember novels he had read. "In the evening, I went to the opera" – meaning he tried to recall opera performances he had attended.

After Joseph Stalin's death, Egon was set free. Upon his arrival home, he found that he now had not only one daughter, but two. Edith found out nine days after Egon was taken away that she was with child.



For several years after his release Egon worked as an economic researcher, but upon writing a book about Keynesian economics he was expelled from the research institute and forbidden to work as an economist. He then returned to his first love, mathematics, and trained himself to become an operations researcher. He solved several practical production and distribution problems and in the mid-sixties he wrote a pioneering paper on implicit enumeration, which later became a Citation Classic as the most frequently cited paper of the journal *Operations Research* (between 1954 and 1982). In 1966, he managed to emigrate with his family and in the following year joined Carnegie Mellon University in Pittsburgh. In the 70's, he developed a theory for optimization over unions of polyhedra, known as disjunctive programming, which has formed the basis of numerous subsequent developments in cutting plane theory for integer and combinatorial optimization. In particular, the lift-and-project approach developed in the 90's by Balas and his coworkers has played a crucial role in triggering the revolution in the state of the art in Integer Programming that occurred during the following decade. Balas also contributed theory and algorithms for various combinatorial optimization problems, like set packing and covering, traveling salesman and its generalizations, knapsack, three dimensional assignment, vertex separator, etc. On the practical side, he has developed various scheduling algorithms and software.

Dr. Balas has taught a variety of courses at different levels, and has acted as thesis advisor to 31 doctoral students. Balas has honorary doctorates in Mathematics from the University of Elche, Spain (2002), the University of Waterloo, Canada (2005), and the University of Liege, Belgium (2008). He has published over 230 articles and studies and he wrote the memoir *Will to Freedom: a Perilous Journey through Fascism and Communism*. Syracuse University Press, 2000 (paperback, 2008), describing his life before migrating to the US.

Balas has spent the last 48 years at Carnegie Mellon University. Although still very active with his research and teaching, Balas also enjoys spending time with his family: besides his wife Edith, he has two daughters, three grandsons and two great-grandsons.



ISE Department Annual ISE Cocktail Hour & Banquet



Pictured from left: Seniors Carly Deskins and Sara Green, ISE Communications Specialist, Abby Barlok, Sophomores Keri McGlothlin and Tony Nikolov, Senior Allison Howard, Junior Royce Kok, Senior Danielle Anneckchino and Master's Student, Alex Wiedorn celebrate a great finish to an extraordinary year.



ISE Professors Luis Zuluaga and Emory Zimmers, ISE Chair, Tamás Terlaky and HSE Director, Ana Alexandrescu present the department's 2015 INFORMS UPS George D. Smith Finalist Prize at the annual banquet.



Tamás Terlaky presents the HSE Student of the Year Award to Phillip Burrell



ISE Faculty Member of the Year Award (Master's), with Master's student Alex Wiedorn, to Larry Snyder.



ISE Faculty Member of the Year Award (Ph.D), with Ph.D. student, Sertalp Cay, to Frank Curtis.



ISE Faculty Member of the Year Award (undergraduate), with David Danko, to Robert Storer.



ISE Advisory Council members Kathleen Turner and Ravi Kulasekaran catch up with Doug Sunday, Research Scientist, Enterprise Systems Center.



ISE Students, Sara Green, Sto Mahoney, Darby Dustman, Sarafina Huck, Allison Howard and Owen Dunbar gather for a great group shot.



Dr. Emory Zimmers, Director of the Lehigh Enterprise Systems Center, reconnects with alum, Kenneth Stott.



Lehigh Ph.D. students, Xiaolong Kuang and Wei Xia, enjoy each other's company before the annual ISE Banquet.



Spring Spencer C. Schantz Lecturer, Egon Balas, chats with ISE Ph.D. student, Kamil Cifti.



Lehigh Ph.D. students, Aykut Bulut and Onur Babat smile for the camera.



ISE Professors Frank Curtis and Ted Ralphs along with Lehigh Ph.D. students, Matt Menickelly and Sertalp Cay, wind down at the cocktail reception.



A group of happy students pause before taste-testing the many refreshments at the reception.

2015 ISE Distinguished Alumni Award in Industry Recipient

Andy Greenawalt '76G



With the exception of his father, Andy Greenawalt was raised by a family of teachers. When it came time to go to college, Andy chose Millersville University for Mathematics. Upon graduation, he went to work as a math teacher at Nazareth Area School District, with hopes of one day becoming an administrator.

However, Andy quickly became disillusioned. It was through a close friend that he heard about a school named Lehigh University. Making a bold move, Andy quit his job (after only one year of teaching) and applied for graduate school at Lehigh. Andy started out in the Computer Science program and after some persuasion from Ben Wechsler, the professor he had for IE 309, transferred to Industrial Engineering.

After receiving his MSIE degree in 1976, Andy took an IT job across town at Air Products. "My assignments were all over the map. I even had a two-year assignment in Europe. My two years at Lehigh and my two years in Europe were the best personal and professional experiences I could have ever received." Andy recalls how their time in Europe gave his two children, who were four and six at the time, a great appreciation of diversity.

After 15 years at Air Products, Andy realized he was near the glass ceiling of his IT career at a chemical company. So, he moved his family southwest to go to work for a small software and services firm in Austin Texas. Two years later he seized an opportunity to join a young upstart computer company across the street called Dell.

At Dell, Andy remembers a pretty bumpy ride for the first 2-3 years. "Dell didn't have any money, systems were failing and the entire company was struggling," recalls Andy. In the fourth and fifth year, things turned around. Dell's growth exploded. "We saw such growth in demand that we couldn't build computers and plants fast enough."

Andy retired from Dell in 2000. Since retirement, Andy has directed his efforts toward various personal projects, consulting arrangements, and volunteer efforts. He has served on a number of non-profit boards. He currently chairs the board of Austin Achieve, an open enrollment public charter school in Austin. Andy explains, "I helped my son's friend open up the charter school. We started with 6th grade and each year we've added a grade. We now have grades 6-9. Most 6th graders enter our school with reading and math levels two to three years behind the norm. We help them catch up. The first year we had 125 students. Today we have 550. When we graduate our first seniors in 2019, we'll have over 1000 students."

Andy presently serves on two advisory councils at the University of Texas at Austin, for the College of Natural Sciences and the UTeach Institute, a nationally acclaimed math/science teacher preparation program. He also chairs Lehigh's Engineering Advisory Council.

Andy credits his time at Lehigh with making him the well-rounded engineer/leader he is today. "Lehigh taught me to see the big picture and how to identify opportunities for improvement in an enterprise. That has carried with me throughout my entire personal and professional life."

Student Check-in

DAVID DANKO

Major and Year: IBE - Industrial Engineering and Finance, Class of 2017



How was your experience as a work-study student in the ISE Department?

I greatly enjoyed my time at the ISE office. It was very helpful to be able to spend time with and get to know the faculty and staff that work here because they are who I will be taking classes and interacting with for the rest of my time at Lehigh. It was also very helpful to get to know the behind the scenes of the Mohler office, now I always know what forms I need for what classes I have to take. The snacks that Rita and Kathy always had for me was also a plus.

What internships have you had?

I'm currently working at the Investment Office on Mountaintop, which is the office in charge of managing the large sum of money which is Lehigh's endowment. I first heard of this internship during the fall of my sophomore year at the IBE career fair when an alumnus mentioned he had interned there when he was a student at Lehigh, coincidentally also in the ISE department. It's been an incredible experience so far and has given me a lot of insight into what I may want to do after graduation.

What job would you like to have once you graduate?

I'd like to work in financial services in New York.

What did it mean to you winning the IBE Sophomore of the Year Award?

After putting in a lot of hard work my freshman and sophomore years it was definitely very motivating to be recognized like that by the department. I also greatly enjoyed the ceremony and banquet, and presenting Professor Storer with his award was a big honor as well.

What are you looking forward to in your junior year?

I'm definitely looking forward to getting more in-depth with some of the subjects within ISE. I've come to enjoy and getting to work with more of the students and professors in the department. I'm also excited to take on more leadership roles on-campus and make the most of my second to last year here at Lehigh.

TONY NIKOLOV

Major and Year: ISE, Class of 2017



Have you done any internships?

I have an internship this summer with a small optical semiconductor manufacturing firm called Aeon Corporation. I heard about them through a family friend, so I decided to apply and the rest is history. I'm helping them with the optimization of their manufacturing process which involves highly precise measurement and calibration with laser diode controllers and laser welders. I've learned quite a few useful things and hope to carry forward my learnings into my future endeavors.

What job would you like to have once you graduate?

I was hoping to get involved in the pharmaceutical or consulting fields upon my graduation, but all of that hinges upon what sort of internship I can manage to find next summer. I don't want to put all of my eggs in one basket just yet, and with the very broad and diverse scope of ISE, you can apply yourself in many different fields, a facet of the major which really attracted me.

What did it mean to you being on the ISE Council?

It made me feel honored that I was handed the privilege and responsibility of representing my peers and the faculty of the ISE department by being on the ISE Council. I hope to rejoin the Council next year and continue to stand for the community.

ALEX WIEDORN

Major and Year: B.S. Chemical Engineering '13, M.Eng. Management Science & Engineering '15



What is your favorite memory from Lehigh and the ISE Department?

Other than when Lehigh beat Duke, my favorite Lehigh memory is when Lehigh celebrated 40 years of women. I had the opportunity to attend the kickoff dinner with Lehigh women from the first graduating class in 1971 to current students. It was a great celebration on campus hearing the stories of alumnae over the past 40 years.

My favorite memory from the ISE department was serving on the ISE Student Council. Working with ISE faculty, staff, and fellow students was a great way to understand more about the department. I think that the ISE Council is a model for involving all years of ISE students in the workings of the department.

What are your plans for Fall 2015?

In Fall 2015, I will start my full time job with PricewaterhouseCoopers in the Tangible Asset Valuation team. I interned with the same group in Summer 2014, and can't wait to start!

How do you feel your experience at Lehigh has prepared you for this new position?

My dad (Lehigh engineer '83, '85G!) always says that education should teach you how to learn since you'll be learning your whole life. Lehigh engineering teaches students just that through coursework and experiential learning.

What advice do you have for present ISE students?

During my undergraduate and graduate education, I was able to make the most of my Lehigh education, both in my academic studies and my campus involvement. There are wonderful people at Lehigh to help students through their education- in residence life, career services, graduate life, athletics, academic departments- and my advice for students is to get to know them. Listen to the advice they give you. I'm so grateful for the wonderful mentors and friends I've met during the past six years. Lehigh has a lot to offer its students, and everyone should make the most of their experience inside and outside of the classroom!

Student Check-in

continued from page 11

JEN MCQUEENEY
(distance education
student from
Maryland)
Major and Year:
HSE, Class of 2016



What is your favorite memory from Lehigh and the ISE Department?

Working as a remote student on group projects. It was great to work with other students from different backgrounds while learning about important healthcare regulations.

What are your plans for Fall 2015?

I will be fulfilling my Capstone requirement at a local hospital (hopefully either Johns Hopkins or University of Maryland Medical System).

How do you feel your experience at Lehigh has prepared you for this new (current or future) position?

The classes and professors have prepared me for my future job by providing me with the tools I will need as well as relevant examples of healthcare today. I've really enjoyed the perspective the adjunct professors from industry bring to the classroom and the fact that they are so willing to share their experiences in healthcare with the students.

What advice do you have for present HSE students?

Ask lots of questions and take the time to participate in the additional events the HSE program has to offer - it will be worth it.

Faculty Update

Katya Scheinberg



ISE Professor, Katya Scheinberg has had quite an impressive last couple of years. Katya received tenure in June 2013, was both promoted to Full Professor and granted the Harvey E. Wagner Endowed Chair Professorship in Summer 2014, and in Fall 2014, was appointed as ADVANCE Chair for the academic year of 2014-2015. In addition, during the recent 22nd International Symposium on Mathematical Programming, held in Pittsburgh in mid-July, Katya was awarded, along with her co-authors, Andrew

R. Conn and Luis N. Vicente, the Lagrange Prize, which is a major award in continuous optimization given for the best publication in six years. Katya, Andrew and Luis won this award for their book, *Introduction to Derivative Free Optimization*.

"I am very happy and it feels great to be appreciated by colleagues within Lehigh and in my professional community. It really has been an incredible few years for me and at times, it is hard to believe. I sincerely want to thank Tamás Terlaky, ISE Department Chair, who has been propelling me towards each of these promotions and honors," Katya admits.

Katya has been hard at work in her main role as Director of the Ph.D. program. As director, Katya ensures and promotes the quality of the Ph.D. program. In particular, her duties involve monitoring students' progress, ensuring that each student has an advisor and is actively working towards a dissertation, coordinating and overseeing qualifier exams each year, planning the Ph.D. program curriculum and conducting Ph.D. admissions. Katya adds, "I am very grateful to my colleagues who actively help me in all these steps. ISE professors, Frank Curtis and Ted Ralphs, work on the admission process very extensively and are also instrumental in planning and implementing the new Ph.D. curriculum."

When asked about the changes to the curriculum, Katya explains, "We have introduced several new courses and composed a coherent sequence of courses that all of our Ph.D. students will take during their first and second year in the program." In the past, only a couple of such courses were required of all Ph.D. students and they had supplemented their curriculum by taking courses outside of the ISE department. Katya adds, "With the addition of our new faculty, we are able to train our Ph.D. students in a more focused way."

Katya also adds that the First-Year Qualifier Exam has been changed to make it more uniform, fair and more consistent with the new expectations within the program. "Each year we seem to be getting higher-quality applicants and recently we started to compete with some of the top IE departments in the country, such as Georgia Tech, Northwestern, Cornell, etc."

Katya spent the summer attending several conferences and spending time traveling with her family visiting her parents in Texas and her in-laws in Turkey. Other than that, Katya tries to spend as much time as possible with her two daughters and also, work on her research, which focuses on developing and analyzing optimization methods where some information may be random and sometimes corrupt. Another project of Katya's is a collaboration with Dr. Brian Chen, Computer Science Engineering, on problems relating to protein and bone alignments.

Lehigh's OptML Group

ISE Professors, Dr. Katya Scheinberg, Dr. Frank Curtis and Dr. Martin Takáč formed (what they call) the “OptML Group” at Lehigh. Their research interests revolve around different optimization methods used for problems arising in machine learning, hence the name Opt for optimization and ML for machine learning. Katya, Frank and Martin meet weekly with their students allowing them to informally present their current work for discussion.

Martin explains, “The deeper goal and meaning of the meetings is for our students to obtain different perspectives on each other’s work. Clearly we all have different backgrounds and fields of expertise. In having a group such as, OptML, it allows everyone to bring something unique to the table in hopes that the end result will make the project better.

“In addition, we discuss recent trends in the intersection between optimization and machine learning and also discuss opportunities for our students. For example, over the past year, a lot of the Ph.D. students attended a workshop at the New York Academy of Sciences on Machine Learning,” says Frank. American Express, a main sponsor for the event, ran a student competition. “My student, Zheng Han, won the competition and later accepted a position at American Express in their Data Sciences group,” explains Frank.

Katya shares, “some of the students in the group are already borrowing from each other’s work, since we are working towards similar goals and can build on each other’s results. Our first goal is to develop faster and better methods which lead to better solutions of real problems. Practitioners often pick the ‘best’ value from a few trial points without thoroughly exploring the parameter space.” With the group’s methods, they should be able to find the true optimal value efficiently, leading to much more efficient solutions, which may be the quality of an engineering design, a marketing plan, a predicting model or even another algorithm’s performance. Katya adds, “Another goal of our group’s research is providing theoretical foundations for classes of relevant optimization methods. This is really important for promoting the use of algorithms. While empirical performance is what matters at the end of the day, without theoretical guarantees no optimization algorithm is considered reliable.”



Another goal of our group’s research is providing theoretical foundations for classes of relevant optimization methods.

The following ISE Department Ph.D. students have worked or are presently working as a part of the OptML group: Ruobing Chen, Xi Bai, Xiaocheng Tang, Matt Menickelly, Alireza Yektamaram, Hiva Ghanbari, Jie Liu, Chenxin Ma, Xi He, Mohammadreza Samadi, Wei Guo, Hao Wang, Xiaocun Que and Zheng Han.

Online Learning



A few years ago it became apparent that more and more classes out of the Industrial and Systems, Manufacturing Systems and Healthcare Systems Engineering programs were being delivered through our Distance Education (DE) operation. Our other DE facilities were already heavily scheduled and course conflicts were growing. Through discussions with Dr. Tamás Terlaky, it was decided we would explore if there were any rooms in Mohler that could be utilized and if so, whether enough funding could be obtained.

With joint funding between DE and ISE, in the amount of \$90,000, the departments were able to equip Mohler Lab, room 451 to deliver classes both in real time (Classroom LIVE) and captured for later asynchronous delivery (Classroom Online). A networked control room was equipped in Mohler Lab, room 371 that operates the 451 classroom and is wired to allow additional classrooms to be utilized.

This DE-equipped classroom has been tremendously helpful in reducing scheduling conflicts with DE rooms and helping to keep ISE, MSE and HSE faculty and students in their home building as much as possible.

Robotics Lab & Course

The Automation and Robotics Laboratory in Lehigh University's ISE Department was established in 1981 and contains industrial robots used for various applications. A flexible automation cell is also a focus of the laboratory. Research aspects include the intelligent control of discrete event dynamic systems as well as issues related to intelligent robots. Such research is directed to solving real world problems.

Many upgrades were made in the Robotics Laboratory in the Spring 2015 semester. The department bought two robots, specifically made for robotics training, complete with industrial grade controllers. Dr. Derya Pamukcu, Director of the Automation and Robotics Lab, explains, "During the Spring term, students were able to do robot programming using the teach pendants, as well as use 3-D simulation software to test the operation of their programs offline before loading them to the actual robot controllers."

The department also purchased state-of-the-art sensors and interfacing hardware. Students were able to use both to design solutions for problems that require integration of robots and manufacturing hardware. Dr. Pamukcu adds, "Most of the students worked on projects



that required integration of sensors and hardware, such as manipulators, to give them some level of autonomous operation in completion of their assigned tasks." Another acquired item was a reprogrammable drone aircraft.

In addition to using the equipment acquired in the robotics class, students in other manufacturing-related classes will also be able to use them. Dr. Pamukcu's plan for further use of the lab is to get heavily involved in the "internet of things" concept as it relates to automated manufacturing. Dr. Pamukcu claims, "I shall be initiating student projects in this direction soon."

Lehigh Legacies

The Greenawalts: Andy '76G, Peggy '79G and Danny'04 '05

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.

Andy Greenawalt, featured above, is extremely proud of his family's roots at Lehigh University. Not only did Andy attend Lehigh as an IE grad student, but his son, Danny, received his degrees from the same department. Andy's wife (Danny's Mom), Peggy, also attended Lehigh, receiving her Master's Degree in Reading (Ed). Only their daughter, Chrissy, chose a different school - Vanderbilt.

Danny recalls a fun tidbit, "I knew my dad went to Lehigh for an engineering masters, but I didn't put it together that I had picked the same department as he did until after I became an industrial engineer. Turns out we had a handful of the same professors!"

While Andy received his Master's degree, Danny received two Bachelor's Degrees while at Lehigh, and was in the first cohort of the IBE program. Danny did exceptionally well and was a President's Scholar. He received both his Bachelor of Science Degree in Industrial Engineering and his Bachelor's Degree in Integrated Business & Engineering in 2004 & 2005. His father explains, "If I was in the same situation as Danny, I would have done the exact same thing. At that time though, IBE wasn't an option for me. I'm glad it was one for him."

When it came time to look at schools, living in Austin TX, Andy recalls Danny's frontrunners. "Rice, Northwestern, Carnegie Mellon, Texas A&M and Lehigh were all in the running. Lehigh just felt great for him. He was born in Bethlehem, loved the smallness of the university and the town - and that was it!" During Danny's Lehigh education, his favorite course at Lehigh was the intro to engineering course. Danny says, "I found it incredibly interesting that it gave students a broad point of view instead of a deep dive into any one discipline."

Danny believes that Lehigh was a great fit for him academically with the IBE combination. Danny explains, "I thrive in a multidisciplinary setting. My vision is to be technically savvy, yet able to communicate and maneuver in a business setting." Danny refers to it as "a geek that can speak."

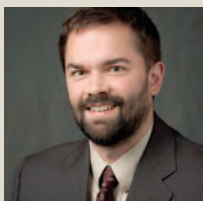
Danny shares, "My advice to a current Lehigh student would be to find the sweet spot where your talents and passions overlap. My passions took me in a very different direction than I expected after college. I found myself working in campus ministry for InterVarsity Christian Fellowship for the last 10 years. I spent my time developing leaders and investing in the lives of young adults on college campuses so that they might grow in their faith. While this work is a bit divergent from IBE, I'm grateful for how the program has shaped me."

Andy is retired and currently serves on a number of non-profit boards, including two advisory councils at the University of Texas at Austin and an open enrollment charter school in Austin. He also chairs Lehigh's Engineering Advisory Council. Likewise, Peggy devotes much of her time in retirement toward various volunteer efforts including managing their church library. This fall Danny will be starting a full time MBA program at Ohio State University as a first step back towards the business world.

Who knows, perhaps someday one or two of Peggy and Andy's five grandchildren will find their way to Lehigh's campus...



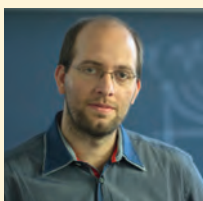
Faculty Highlights



Frank Curtis has been promoted to Associate Professor with tenure.



Katya Scheinberg was awarded, along with co-authors, Andrew R. Conn and Luis N. Vicente, the Lagrange Prize, which is a major award in continuous optimization given for the best publication in six years. Katya, Andrew and Luis won this award for their book, *Introduction to Derivative Free Optimization*.



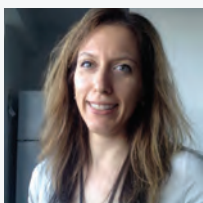
Martin Takáč has been appointed as a Rossin Jr. Professor.



Professor Larry Snyder is a co-PI on a project entitled “Probabilistic Resilience Assessment of Interdependent Systems (PRAISys)”, which was recently funded as part of the NSF’s Critical Resilient Interdependent Infrastructure Systems and Processes (CRISP) program. The project is led by Prof. Paolo Bocchini of Lehigh’s Civil and Environmental Engineering Department, with team members from several other Lehigh departments as well as from other universities. The purpose of the research project is to establish and demonstrate a comprehensive framework that combines models of individual infrastructure systems with models of their interdependencies for the assessment of interdependent infrastructure system resilience for extreme events under uncertainty. For more information, see the PRAISys web site at <http://www.praisys.org/> or the NSF press release at http://www.nsf.gov/news/news_summ.jsp?cntn_id=136266.



ISE Department Chair, Tamás Terlaky, was honored this past June at a three-day conference entitled “Paths, Pivots, and Practice: The Power of Optimization” in Montreal. The conference was held to honor Dr. Terlaky on the occasion of his 60th birthday. While in Montreal, Dr. Terlaky also received the CORS 2015 Award of Merit for his impressive contributions to the field.



Aurelie Thiele has returned to Lehigh after her 2014-2015 sabbatical at MIT as a Visiting Associate Professor.



Luis Zuluaga is the Chair of Lehigh’s Faculty Financial Planning Operations Committee.

Visiting Post Docs

Elsbeth Adams is a post-doc working on bilevel optimization with Dr. Ted Ralphs. She arrived in August 2015 and will be at Lehigh for at least a year. Elspeth received her PhD in engineering mathematics from Ecole Polytechnique in Montreal, Canada. Her work focused on projection based cuts for tightening semidefinite relaxations of certain combinatorial problems such as the max-cut and stable set problem.

Fatma Yerlikaya-Özkurt is a post-doc working on convex optimization with Dr. Tamás Terlaky. Fatma received her masters and doctorate degrees in scientific computing at Institute of Applied Mathematics, Middle East Technical University in 2008 and 2013. Fatma expects to finalize her post-doc study in February 2016.

MOPTA 2015 Conference Held at Lehigh

The department, for the 7th year in a row, hosted the annual Modeling and Optimization Theory and Application (MOPTA) conference July 20-22. This year, the conference was co-chaired by Dr. Martin Takáč and Dr. Sasha Stolyar and featured close to 90 contributed talks, both from the academic and industrial fields.

MOPTA had seven plenary speakers this year: Alper Atamturk (University of California-Berkeley), Amir Beck (Technion-Israel Institute of Technology), Mirjam Dur (University of Trier), Eugene A. Feinberg (Stony Brook University), Ravi Mazumdar (University of Waterloo), Luis Nunes Vicente (University of Coimbra, Portugal) and Tong Zhang (Baidu's Bid Data Lab; Rutgers University).



Plenary speakers, Mirjam Dür, Amir Beck and Eugene A. Feinberg enjoy one of the 90+ talks at MOPTA.



ISE Chair, Tamás Terlaky thanks Luis Nunes Vicente for his contribution as a plenary speaker at the conference.



Participants listen to one of the many talks of the MOPTA Conference.



Peter Nieuwesteeg, AIMMS, gives his presentation before the winners of the 2015 AIMMS-MOPTA Optimization Modeling Competition are announced.



Dr. Miguel Anjos and Tamás Terlaky present Jason Hicken, Rensselaer Polytechnic Institute, with the Best Paper Award for Optimization and Engineering in 2014



Xin Shen and Jubiao Yang pose after receiving Honorable Mention in the 2015 AIMMS-MOPTA Optimization Modeling Competition.



Pictured are the winners of the 2015 AIMMS-MOPTA Optimization Modeling Competition. Team "DOM" from the University of Twente, Netherlands, consisted of Victor Reijnders, Martijn Schoot Uiterkamp and Mike Visser.



Ph.D. students served as volunteers during the MOPTA Conference and were a big help, especially with the MOPTA Student Social held on the first night of MOPTA.

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



Anthony Hillman '98
VP of Operations
MNG Direct



Richard Holtz '67
CEO
InfiniSys Inc.



Barry Levine '81
Founder
Microcomputer Consulting
Group, Inc.



Deborah Nagel '98
Senior Buyer
General Motors



George Snow '81
Executive Vice President
Full Circle Systems

...we welcome our five new Advisory Council members.

Jennifer Kennedy '02

Kiva Systems - an Amazon company

In a 13 year career in Industrial and Systems Engineering, Jennifer Kennedy has held a wide array of roles in engineering leadership and operations management at UPS and Amazon Robotics. Her contributions are focused on leading teams in operations, transportation and network planning and warehouse and system design. Her current role is the Director of Solutions at Amazon Robotics where she leads a team of 20 engineers in data analysis and engineering the system design of the Kiva mobile robotic storage and retrieval solution.

Jennifer earned a B.S. in Industrial Engineering from Lehigh University and an MBA from Northeastern University. She was the president of the SWE Lehigh University section and has fond memories of increasing the membership four-fold in three years. Jennifer holds a board position for the SWE Boston Professional section and enjoys supporting the nine collegiate sections in the Boston area. During her time at UPS, Jenn founded a Women's Leadership Development group to create a peer mentoring network and has since founded the Women in Technology group at Amazon Robotics in order to focus on advancing the careers of technical women.



Jason Lambert '99

Sikorsky Aircraft Division of United Technologies Corporation

Jason Lambert is a Program and General Management Executive at the Sikorsky Aircraft division of United Technologies Corporation. In his current role, Jason manages the P&L and execution of the Turkish Utility Helicopter Program (TUHP).

TUHP is a licensed co-production program with Turkish Industry to manufacture 109 T-70 helicopters (Turkish variants of Sikorsky's S-70i™ International BLACK HAWK helicopter) for operation by the Turkish Government, and to assemble an additional 109 S-70i™ helicopters for Sikorsky to sell to international markets. Options exist for the potential to produce up to 600 aircraft.

Prior roles at Sikorsky include: General Manager of the Troy, AL aerostructures manufacturing and assembly facility responsible for the P&L and lean transformation; the COO of the Coatesville, PA facility responsible for the production and delivery of Sikorsky's Commercial OEM products; and the Operations Manager of the Assembly & Flight Operations business in Stratford, CT responsible for planning and control, process improvement, and industrial engineering.

Prior to Jason's career at Sikorsky, he worked at Deloitte Consulting LLP in their Strategy & Operations practice where he held roles of increasing responsibility specializing in advisory services for consumer and industrial product corporations.



Jason holds an MBA with Honors from Carnegie Mellon University and a B.S. in Industrial Engineering from Lehigh University. He has guest lectured on Operations Management and Manufacturing Strategy in the MBA programs at Carnegie Mellon University and Cornell University. Jason resides in Trumbull, CT with his wife Lisa, son Jason Jr., and daughter Brooke.

Karen LaRochelle '88

LaRochelle Advisors, LLC

Karen J. LaRochelle is the owner of LaRochelle Advisors and the Senior Vice President of Chase Pharmaceuticals, a biotechnology company focused on Alzheimer's Disease. Karen is a collaborations professional with broad transaction experience who has negotiated and executed over 40 transactions with biotechnology, pharmaceutical, technology, and international companies.

She holds 20 years of deal-making experience from Bristol-Myers Squibb including as Global Head of Negotiations and Head of Business Development in China.

Karen holds a B.S. in Industrial Engineering from Lehigh University and an M.B.A. from Columbia University. Following graduation from Lehigh's IE program ('88), Karen worked for 3 years for Accenture as a senior consultant. Karen serves on the Business Development advisory board of New Jersey's biotechnology council, BioNJ. She lives near Princeton, NJ with her husband and three sons.

Karen previously served on the ISE Advisory Council from 2008 to 2011.



Kurt J. Lesker IV '05

Kurt J. Lesker Company

Kurt J. Lesker IV is Vice President of Sales at Kurt J. Lesker Company, a global provider of high-quality vacuum products and systems based in Pittsburgh, Pennsylvania. In his role as VP of Sales, Kurt has overall responsibility for driving direct and partner sales related activities in over 50 countries.

Before being named VP of Sales in 2014, Kurt lived and worked in China as Vice General Manager of Asian Operations, developing the KJLC brand and distribution infrastructure. He also spent five years as Global Quality Manager establishing the company's ISO 9001 Quality Management System and implementing Lean Manufacturing practices.



Prior to joining KJLC, Kurt worked for Navigant Consulting in New York as a Litigation Consultant in the Construction Practice. Kurt earned an M.B.A. from Duke University, where he was a Fuqua Scholar, and a Bachelor of Science degree in Industrial Engineering from Lehigh University. Kurt is a Private Pilot and avid rower. He currently resides in Pittsburgh, Pennsylvania with his wife Laura (Lehigh '05 Finance) and their rescue dog Bogey.

Richard Simek '94, '95G

Hypertherm Inc.

Richard has over 18 years of experience driving strategic growth and operational excellence for companies specializing in high technology products. Richard began his career as a Corporate Researcher at Mack Trucks in 1995 and then later switched to Northrop Grumman Corporation where he was selected to participate in the Professional Development Program. After completing four rotational assignments, Richard accepted a Manufacturing Engineering position in the Mechanical Fabrication team. Richard also held a variety of managerial positions in different sectors of Northrop Grumman Corporation.

In 2002, Richard changed companies and became the Consumable Operations Engineering Manager at Hypertherm, Inc. Through his career at Hypertherm, he has traveled extensively evaluating operational and go-to-market strategy for a variety of countries, including China.

In 2008, Richard was appointed General Manager of a newly created business unit at Hypertherm where he successfully launched improved performance upgrade products for the installed base while relocating the operations to a new state of the art manufacturing facility in Lebanon, NH. Most recently he was appointed as the GM of their Mechanized Torches and Consumables business unit.

Richard earned a B.S. in Industrial Engineering in 1994 and an MS in Industrial & Manufacturing Systems Engineering from Lehigh University in 1995.



Q&A With the Founders of the ISE Affinity Group

Ray Glemser, Keith Krenz & Ray Hoving

What is the ISE Affinity Group?

Keith Krenz: First, the advancement of LU ISE via its academic and research achievements leading ultimately to the success of its graduates. Secondly, a “place” where affinity group members (I would generally assume to be composed of alumni) can share/exchange technical information and/or experiences in their professional lives. Information exchange can also include some of the detailed information presented at ISE Advisory Council meetings, specific challenges facing the Department, core Department goals and status, etc.

Ray Glemser: The ISE affinity group is part of the Lehigh alumni affinity program through which alumni volunteers may support the Industrial and Systems Engineering department.

What is the purpose of it?

Ray Hoving: Our mutual experience at Lehigh creates a unique bond that stands the test of time. This group brings the networking opportunity to the forefront.

What do you hope to achieve with it?

Ray Glemser: The initial focus will be on reconnecting ISE alumni with each other and the ISE department through sharing ISE developments and soliciting industry feedback on ISE programs. I would then like to encourage participating alumni to consider becoming Lehigh volunteers and contribute to the ISE department in personally meaningful ways, such as serving as ISE advisory council members, guest lecturers and re-union captains. Ultimately, I would like the ISE affinity group to promote professional development and engagement for ISE alumni and financial support to ISE department operations and strategic programs.

Ray Hoving: Socialize with a wide range of participants. Give back for the betterment of our profession.

What made you want to become involved with this group?

Ray Glemser: I felt that my service on the ISE advisory council was personally meaningful and rewarding. I learned of Lehigh’s alumni affinity program and wanted to make additional contributions to the department as a Lehigh volunteer and encourage other alumni to do the same.

What are your hopes of others getting involved?

Keith Krenz: First, the greater the number of alumni participants the greater the resources available to help LU ISE improve and achieve its objectives and key goals. Second, the greater the number of alumni participants, the greater the benefits to the participants.

Ray Hoving: Everyone can benefit from and contribute to the Group in different ways depending on your career progression and personal interests.

What do you want to communicate to other alumni about this group?

Ray Glemser: I would like every ISE alumnus throughout the world to consider joining the ISE affinity group to explore ways to support ISE alumni, faculty and students.

Ray Hoving: Give it a try. Let’s see what we can do to apply the Lehigh spirit in us towards this effort.

How can alumni become involved?

Ray Hoving: It takes a small core to get it started and form the basis of a long-standing organization. Then it takes a larger group to keep it going.

Ray Glemser: Email Abby Barlok at abby.barlok@lehigh.edu if you are interested!

Will volunteering and being a cheerleader take up a lot of time?

Ray Hoving: It takes only the time you are willing and able to provide.

Ray Glemser: I would like to ask volunteers for two hours a month: one hour to coordinate and one hour to execute. As volunteers learn about the different opportunities to contribute, they may choose to increase their hours of participation for a particular event or program.

What are the expectations of being a volunteer/cheerleader?

Keith Krenz: Keep making progress regarding the affinity group. A few examples include try recruiting members; keep affinity group discussions going; support efforts to keep topics fresh and relevant; keep LU ISE needs, objectives and goals actively discussed; etc..

Ray Glemser: Volunteers are expected to monitor and provide feedback through ISE affinity group communications. They may also choose to participate in Lehigh ISE events and programs, coordination calls and alumni outreach.

DataX

Lehigh recently launched DataX, a university-wide initiative to develop multi-disciplinary research and educational programs in Data Science. Although the details of how the initiative will be developed in the coming years are still unclear, significant university resources, including a projected \$60 million in solicited donations and a substantial number of new faculty positions have been slated for the project. This unprecedented commitment signals Lehigh's recognition of the importance of this strategic area in which ISE has already made significant investments and is already a major player.

The initiative marks a significant new strategic direction for Lehigh. It is anticipated that DataX will spur development of computationally-based research and educational programs, as well as computational infrastructure, closing a substantial gap that has opened between Lehigh and its aspirational peers. To address that deficit, Lehigh will make targeted investments to shore up its institutional capabilities in key computational disciplines, such as machine learning, data mining, and optimization, as well as application areas such as digital media and marketing.

One of the most exciting aspects of the DataX initiative is its synergy with the strategic direction ISE has been pursuing vigorously since roughly the year 2000. It was at that time that ISE began building a core strength in Analytics, the science of applying computational methods to the analysis of data in support of better decision-making. Since that time, we have invested heavily in developing a richer portfolio of courses at every level, sophomore through Ph.D, as well as developing a strong research group led by young faculty with core expertise in data science, machine learning, and high performance computing. In 2011, the ISE department, with strong support from its alumni Advisory Council, declared Analytics as its strategic priority for the next decade. In more recent years, this strategic direction has evolved into a broader set of disciplines explicitly encompassing expertise not only in traditional analytics disciplines, but also in methods for large-scale computation and data science.

ISE has not been alone in foreseeing the importance of developing an institutional expertise in disciplines related to data science. In partnership with the CSE and Math departments, a research cluster in Big Data Analytics was proposed and became a finalist in Lehigh's internal cluster development competition. We are excited to see that the DataX initiative is quite closely aligned with the philosophy of the previously proposed Big Data Analytics cluster and should thus provide a platform for development of some of the programs that have already been envisioned.

We look forward to working with Provost Farrell, DataX Director Dan Lopresti, and faculty in other departments in growing Lehigh's capabilities in these important areas. To view the Data Science and Analytics white paper, visit <https://ise.lehigh.edu/content/data-science-and-analytics>. To view Ted Ralphs' Mountain Talk on Data Analytics, visit <http://mylehigh.lehigh.edu/mountaintalks>. See the ISE website, <https://ise.lehigh.edu>, for more details, as the project progresses.

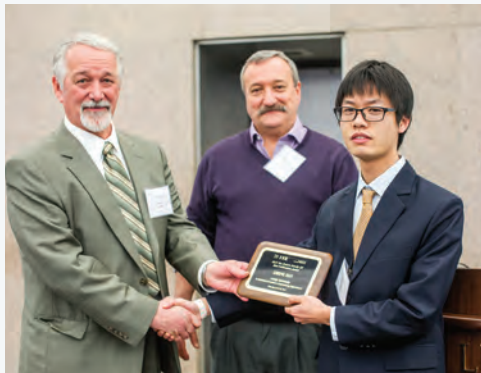
The Van Hoesen Family Best Publication Award

This year, the ISE Department was pleased to announce the first annual Van Hoesen Family Best Publication Competition. This competition was made possible due to an extremely generous gift from the Van Hoesen family.

At the previous ISE Banquet in 2014, Everett Van Hoesen '55 was honored and given the Distinguished Alumni Award for his contributions in industry. Everett and his ever-growing family of almost ten Lehigh University graduates, created the competition, which is open to all ISE department students. The winner, Ph.D. student Zheng Han was announced at the 2015 ISE Banquet on April 16th.

We congratulate Zheng Han on winning the award and \$1,000 prize and hope to have many more submissions next year!

*Next year's winners will be announced at the 2016 ISE Banquet.



We congratulate Zheng Han on winning the award for his paper entitled, "Globally Convergent Primal-Dual Active-Set Methods with Inexact Subproblem Solves." Along with a plaque, Zheng also received a \$1,000 prize.



Master's student, Jilian Sloand, won Honorable Mention for her paper entitled "Assessing the Financial Viability of Stratified Medicine Using Decision Tree Analysis."

2015 INFORMS Conference



Meeting in Philadelphia offers education, networking & history

The 2015 INFORMS Annual Meeting will be held Nov. 1-4 at the Pennsylvania Convention Center and Philadelphia Marriott Downtown hotel, which are located in the heart of Philadelphia.

The General Chair of this year's conference is Lehigh University's ISE Department Chair, Tamás Terlaky.

The meeting will offer not only educational opportunities but also several networking opportunities. The Welcome Reception will be held on Sunday evening (Nov. 1), subdivision meetings will be held predominantly on Monday evening (Nov. 2) and the General Reception will be held Tuesday evening (Nov. 3). The Career Fair will provide an opportunity to meet and collect resumes from many job seekers and the ability to set up private interviews.

An impressive list of plenary and keynote speakers will deliver talks from a wide variety of application areas, including data sciences, healthcare, energy, security, service systems, logistics, the environment and more. Margaret Brandeau of Stanford University, Michael Jordan of U.C. Berkeley, Bill Rouse of Stevens Institute of Technology and Alfred Spector of Google will deliver plenary presentations. Keynote speakers will include Mihai Anitesch of Argonne, Alper Atamturk of U.C. Berkeley, John Glaser of Siemens, Sanjay Mehrotra of Northwestern University, Kavita Ramanan of Brown University and Steve Wright of the University of Wisconsin- Madison.

For more information regarding the 2015 INFORMS Annual Meeting, visit <http://meetings2.informs.org/philadelphia/>.



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/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.

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.

mylehigh.lehigh.edu/giveISE

Follow ISE!

"Lehigh University's Industrial and Systems Engineering Dept" group

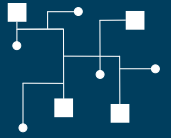


www.facebook.com/LehighISE



www.twitter.com/lehigh_ise





Industrial and Systems Engineering Department
Lehigh University
200 West Packer Avenue
Bethlehem, PA 18015
610-758-4050
<https://ise.lehigh.edu>