

# INDUSTRIAL AND SYSTEMS ENGINEERING

MID-YEAR UPDATE  
SPRING 2019



*Spring*  
**FEVER**



**LEHIGH**  
UNIVERSITY

P.C. Rossin College of  
Engineering and Applied Science



## CHAIR'S MESSAGE

### DEAR LEHIGH ISE COMMUNITY,

More than six months have passed since I have started my chair term, and it is a pleasure to see our ISE Department as vibrant as ever.

I will certainly have many exciting things to report in my chair's message for the 2019 edition of the newsletter, but I can already reveal some of what is going on.

The Department has now a new webpage, and one is taken there using either the old address (<http://ise.lehigh.edu/ise>) or the new one (<https://engineering.lehigh.edu/ise>). The information has been reorganized and the new design follows the new College templating. The page displays many new contents, an example being the research directions that we are currently following here at ISE Lehigh.

I have been working closely with the ISE Advisory Council since my arrival, in particular with its new chair, Rich Wasch, who has been outstanding in commitment, professionalism, and dedication to us. One of the many things we did together was a questionnaire sent to recent alumni to better know their industry sector and job function and what ISE tools do they use the most.

There is much more to tell in the coming months! I wish you all a pleasant Spring, Luis.



**LUIS NUNES VICENTE**  
ISE Department Chair

## ISE DEPARTMENT MID-YEAR NEWSLETTER | SPRING 2019

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## INFORMS Computing Society Prize



ISE Professor Frank E. Curtis, along with James V. Burke (University of Washington), Adrien S. Lewis (Cornell University), and Michael L. Overton (New York University), received the 2018 INFORMS Computing Society Prize. The Prize is an annual award for the best English language paper or group of related papers dealing with the Operations Research/Computer Science interface. They were awarded for their work "Gradient Sampling Methods for Nonsmooth Optimization" at the 2018 INFORMS Conference in Phoenix, Arizona in November 2018.

## Larry Snyder Publishes Book of Puzzles



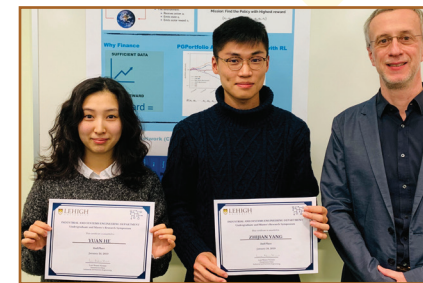
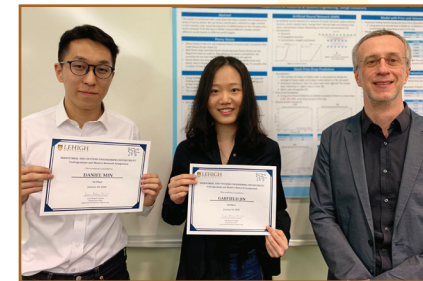
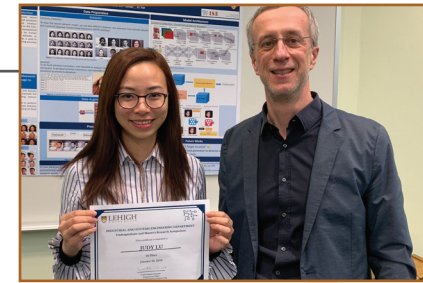
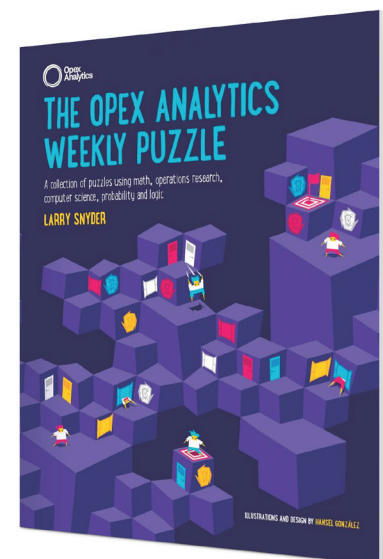
ISE Professor Larry Snyder has published a book entitled "The Opex Analytics Weekly Puzzle: A Collection of Puzzles Using Math, Operations Research Computer Science, Probability and Logic."

From the publisher: "Every week, Dr. Larry Snyder poses a puzzle and challenges our team to find the best solutions they can, often in unexpected and remarkable ways..."

Now it's your turn! This book contains masterfully crafted and richly illustrated puzzles with carefully explained solutions that often include optimization models, Python code, and beautiful visualizations."

*Opex Analytics, an AI firm founded in 2013, published the book in December 2018.*

*It is available for purchase on Amazon.*



## 2019 Undergraduate & Master's Research Symposium

Three student teams presented their work at the ISE Department Undergraduate and Master's Research Symposium on January 24, 2019. The Symposium showcased the exceptional academic capabilities of ISE students and highlighted the resources and opportunities ISE provides to undergraduate and master's students. The competition was open to all ISE department undergraduate and master's students.

The selection committee consisted of Professors Takáč, Terlaký, Defourny, Plebani, and Pinter. Each student team presented their research to the selection committee, who then reviewed the projects and announced the following awards:

- 1st Place, Master's: Judy Lu and Shihwei Wang for "Image Processing and Multi-Domain Translation".
- 1st Place, Undergraduate: Daniel Min and Garfield Jin for "Using Deep Learning to Predict Stock Price Drop".
- 2nd Place, Undergraduate: Zhijian Yang and Yuan He for "Reinforcement Learning in Finance".

The ISE Department congratulates these students on their excellent work.

## Van Hoesen Family Best Publication Competition

The 2018 Van Hoesen Family Best Publication Competition declared two winners. Congratulations to Lam Nguyen, who was awarded a first place certificate for his paper entitled "SARAH: A Novel Method for Machine Learning Problems Using Stochastic Recursive Gradient", and to Hiva Ghanbari, who was awarded a first place certificate for her paper entitled "Directly and Efficiently Optimizing Prediction Error and AUC of Linear Classifiers." The selection committee was chaired by Professor Zuluaga with Professors Ralphs and Takáč. ISE thanks the Van Hoesen family for their continued generosity in recognizing student excellence.



## Mentor Appreciation Award

Congratulations to Healthcare Systems Engineering Program Director and ISE Professor of Practice Ana Alexandrescu, who received a Mentor Appreciation Award for her achievement in graduate mentorship at the second annual Mentorship Appreciation Cocktail Night on Friday, November 2, 2018, hosted by Lehigh's Graduate Student Senate and Graduate Life Office.

## Lawrence E. White Fellowship Announcement

We are pleased to announce that current Lehigh ISE senior Andre Verduzco has received the Lawrence E. White Fellowship for Master's in Management Science and Engineering. The Lawrence E. White Fellowship is made available through the generosity of Lehigh and department alumnus, Lawrence E. White ('64, '65, '69), for full tuition toward 30 credits of master's degree study in the Management Science and Engineering Master's Program. Andre will be formally awarded the fellowship at the ISE annual banquet on Thursday, May 2, 2019.

## CORRECTION

*We apologize for an error in the 2018 Newsletter. On page 14, in the ISE Advisory Council section, Kurt Lesker III was incorrectly listed as a leaving member. Kurt Lesker IV left the council in August 2018. A corrected version of the newsletter can be found on our website: <https://ise.lehigh.edu>*



### Spring Spencer C. Schantz Technical Talk

*Wednesday, April 24, 2019  
4:00 p.m. – 5:00 p.m.  
Mohler Lab, Room 451*

#### **DR. R. TYRRELL ROCKAFELLAR**

**“Risk and Reliability in Optimization Under Uncertainty”**

Ralph Tyrrell (Terry) Rockafellar has long been associated with the University of Washington, Seattle, where he is Professor Emeritus of Mathematics, but he has also contributed in recent years as Adjunct Research Professor of Systems and Industrial Engineering at the University of Florida, Gainesville, and as Honorary Professor of the Department of Applied Mathematics at Hong Kong Polytechnic University. His interests span from convex and variational analysis to problems of optimization and equilibrium, especially nowadays applications in finance, engineering and economics involving risk and reliability, along with schemes of problem decomposition on convex and nonconvex programming.

In addition to being a winner of the Dantzig Prize given jointly by SIAM and the Mathematical Programming Society (1983), Prof. Rockafellar has gained international recognition for his work through honorary doctorates bestowed by universities in a number of countries. INFORMS awarded him and Roger Wets the 1997 Lancaster Prize for their book *Variational Analysis*, and in 1999 he was further honored by INFORMS with the John von Neumann Theory Prize for his fundamental contributions to the methodology of optimization. He has authored over 250 publications, including one of the all-time most highly cited books in mathematics, *Convex Analysis*.



### Spring Spencer C. Schantz Public Lecture

*Thursday, May 2, 2019  
4:00 p.m. – 5:00 p.m.  
Neville Auditorium*

#### **STACEY CUNNINGHAM '96**

**“Engineering the 21st Century Stock Exchange”**

Stacey Cunningham is the President of the NYSE Group which includes the New York Stock Exchange and a diverse range of equity and equity options exchanges, all wholly owned subsidiaries of Intercontinental Exchange (NYSE: ICE). She is the 67th President and the first woman to lead the NYSE Group in its 226 year history.

Cunningham is a respected equities industry veteran having held senior positions in global exchanges throughout her career. Most recently, she was the NYSE Chief Operating Officer where she was responsible for NYSE's three equity markets and two options markets. In this capacity she led the company's strategy for its equities, equity derivatives and exchange-traded funds businesses. She also spearheaded the roll-out of NYSE's state-of-the-art trading platform NYSE Pillar, one of the most ambitious technology programs ever completed by a global exchange.

Prior to serving as COO, Cunningham was President of NYSE Governance Services, a provider of governance, compliance, and education solutions for companies and their boards. Cunningham also served as Head of Sales & Relationship Management at NYSE, where she managed the sales team for U.S. cash equities and options markets. Before joining NYSE, Cunningham held several senior positions at Nasdaq.

Cunningham earned her B.S. in Industrial Engineering from Lehigh University.

## upcoming events

#### **Spencer C. Schantz Technical Talk**

Wednesday, April 24, 2019  
4:00 p.m. – 5:00 p.m.  
Mohler Lab, Room 451

#### **Spencer C. Schantz Public Lecture**

Thursday, May 2, 2019  
4:00 p.m. – 5:00 p.m.  
Neville Auditorium

#### **ISE Department Cocktail Reception & Annual Banquet**

Thursday, May 2, 2019  
5:30 p.m. - 9:00 p.m.  
Asa Packer Dining Room  
Invitations to follow

#### **Reunion Weekend**

June 7 – 9, 2019