



Rensselaer

2015-2016

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ise

where *i* means interdisciplinary

Industrial and  
Systems Engineering



John T. Wen  
Head, Department of  
Industrial and Systems  
Engineering

## Message from the Head

“May you live in interesting times.” This saying, purportedly ancient Chinese but more likely of western origin, fits well with the age we live in. The breakneck pace of innovation and ubiquitous connectivity has dramatically impacted lives, from the sharing/gig economy like AirBnB and Uber, to the Internet of Things (IoT) that allows our refrigerator to talk to our oven for meal preparation, to self-driving cars and drones that will transform our transportation and delivery systems. At the same time, our society is facing serious challenges such as severe weather, oil spills, the threat of terrorism, and breaches in cyber security. In this rapidly changing landscape, systems level thinking is more important than ever. Instead of relying on experience and intuition alone, the systems approach uses modeling and data to understand relationships, characterizing uncertainties between key driving factors and measurable indicators, helping us formulate rational decisions about our environment.

“Systems level thinking is more important than ever—using modeling and data to drive rational decisions about our environment.”



ISE faculty are actively developing systems-oriented methodologies and solutions to tackle some of the most pressing issues.

With such vibrant research activities, we pride ourselves on the ability to infuse real-world motivations into the strong analytical foundation of our courses.

ISE faculty are actively developing systems-oriented methodologies and solutions to tackle some of the most pressing issues. A leading area of research strength for the department is resiliency. This area is highlighted in the Rensselaer Plan 2024 as a key Institute-wide research priority under the theme “Infrastructure, Resilience, Sustainability, and Stewardship.” According to the Presidential Policy Directive on Critical Infrastructure Security and Resilience, resiliency means the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruption. Al Wallace analyzes the role of social media in generating actionable information in disaster response and traffic management. David Mendonça studies team dynamics for more effective organization and response in emergency events (see his terrific talk on YouTube about this work). Tom Sharkey develops distributed decision-making and optimization strategies for infrastructure restoration. Martha Grabowski develops risk analysis and mitigation strategies for critical infrastructure systems. This broad array of research has been supported by the Department of Homeland Security, the Department of Transportation, the Army Research Office, the Coast Guard, and the National Science Foundation. Supply chain management is another important theme of the department that also has a resiliency component. Jennifer Pazour, who joined us in fall 2015, develops modeling and optimization tools for military supply chain, peer-to-peer capacity sharing, and healthcare logistics. Wei Xie, who joined us in fall 2014, is applying statistical and data analytics techniques to model uncertainties in supply chains and to optimize inventory and production while managing risk.

Our faculty’s research is garnering attention and making impact. Martha Grabowski led the National Academy of Science study on the preparedness and response of Arctic oil spill. David Mendonça is serving as a program director in infrastructure and extreme events at the National Science Foundation for 2015-2017. Jennifer Pazour was recently invited by Warehouse Education Resource Council (WEREC) to provide insights into current critical issues in the logistics area. Wei Xie’s work on input uncertainty was recently recognized by the Institute for Operations Research and Management Sciences (INFORMS) Simulation Society for the 2015 Outstanding Publication Award.

With such vibrant research activities in the department, we pride ourselves on the ability to infuse real-world motivations into the strong analytical foundation of our courses. Tom Sharkey has been leading an effort to develop instructional videos on specific operations research (OR) topics and applications on YouTube (from deciding on a cat’s daily menu to football draft pick—who knew these were OR problems?). These videos have been viewed by students not just at Rensselaer, but also throughout the world. Tom’s excellence in teaching was recognized with the 2015 Rensselaer Alumni Association Teaching Award. And for both outstanding teaching and research, he was honored with the 2015 ISE Faculty Award for Excellence. Tom was also promoted to the Associate Professor rank with tenure in 2015—an all-around banner year!

We continue to look for opportunities to engage industry in our research and curriculum.

We are developing collaborations with GlobalFoundries, Regeneron, St. Peter’s Health Partners, and Sandia National Lab with particular emphasis on data analytics. Together with the Office of Graduate Education and Rensselaer Hartford, we are offering a special version of our Master of Science in Systems Engineering and Technology Management (SETM) to working professionals at Pratt and Whitney in Maine.

We also value our alumni and recognize the important role they will play in our continued success. We have a long and illustrious history of graduates, since the first management engineering degree in 1933. Our alumni are all over the world and are impacting a diverse array of industries—from manufacturing to financial—government agencies, and the military. It is now easier than ever to stay connected, through the department LinkedIn group and Twitter. I also look forward to connect with alumni during my travels. In July 2015, for example, with the help of Ann Campbell (on the School of Engineering Advisory Council) and John Lorio (on the ISE Departmental Advisory Council), both with the Sandia National Lab, Dean Garde and I had a wonderful Rensselaer alumni reception in Albuquerque. It was terrific to see the many Rensselaer alumni—graduates from 1960s to just a few years ago.

I am always thrilled to hear from alumni—so please continue to drop me a line on how you are doing, and share with us your thoughts and suggestions for the department, your experience at Rensselaer, and how that experience shaped your career and life. Please also consider a financial gift to the department. Such support is particularly important to provide additional resources for students, including supporting undergraduate research projects, student travel to attend and present at major conferences, and graduate student teaching Fellows to develop innovative curriculum materials.

Be well, do good work, and keep in touch!  
(Nod to Garrison Keillor)

John T. Wen, Professor, Department Head

Go to [ise.rpi.edu](http://ise.rpi.edu) for links to faculty talks and tutorials, information on how to stay connected to us with LinkedIn and Twitter, and how to donate to the department.

## ISE Welcomes New Faculty Jennifer Pazour



ISE welcomes Dr. Jennifer Pazour joining Rensselaer as an Assistant Professor. Dr. Pazour received a B.S. in Industrial Engineering from South Dakota School of Mines and Technology in 2006, and M.S. and Ph.D. in Industrial Engineering from University of Arkansas in 2008 and 2011, respectively. She joined University of Central Florida (UCF) in August 2011. She received the prestigious Office of Naval Research (ONR) Young Investigator Award in 2013. She was also named the CAE Link Faculty Fellow from the College of Engineering and Computer Sciences at UCF from July 2012 to August 2014. Her research interests are in the development and use of analytical models to guide decision making in service industries, which has focused on military logistics, distribution and transportation systems, healthcare logistics, and peer-to-peer resource sharing systems. Dr. Pazour also maintains a blog <https://jenpazour.wordpress.com/> and a twitter feed <http://twitter.com/jpazour> describing her teaching and research, and thoughts and views related to industrial engineering and operations research.

## First Term of ISE Advisory Council Completed

The ISE Advisory Council has recently completed their term. We are grateful to the Council members for taking time from their busy schedule to provide help to the department: our successful ABET accreditation, departmental SWOT (strength-weakness-opportunity-threat) analysis, connections with research opportunities, personal contributions, and general advice and feedback.

The Advisory Council members are:

- **Dudley Andersen** President, TAK Capital Management
- **John Hendrick** (Former) Manager of Business Data Management, Raytheon
- **Ken Kinsley** Chair of Board, Kinsley Group
- **John Lorio** Manager of Surveillance, Sandia National Lab
- **Anne Massey** Associate Vice Provost, Indiana University
- **Lynn Momrow-Zielinski** Founder, Extereme Molding
- **Daniel Pickett, III** Chair of Board & CEO, Infrastructure
- **Chris Vasiloff** Owner, Cool Breeze Cyclery, Trek Bicycle
- **Kevin Young** Founding Partner, Young, Sommer LLC
- **Jose L. Zayas-Castro** Associate Dean of Research, U. of South Florida



## Social Media in Response to Extreme Events



William (Al) Wallace,  
Yamada Corporation  
Professor

Even prior to the launch of Twitter in 2006, faculty and students in ISE were engaged with faculty and students in Computer Science in research on social media.

While our colleagues in Computer Science focused on developing the algorithms needed to process the immense amount of data now available, our concern was trying to ensure that this processed data provided useful, actionable, information for decision makers. We have focused on extreme events such as natural disasters (e.g. 2011 Japan Tsunami and 2012 Hurricane Sandy), social unrests (2015 Baltimore Protests), and armed conflict (2013 Syria sarin gas attacks). Social media (e.g. Twitter) serves as a communications channel where people converge to compile collective intelligence, provide event reporting, and diffuse information.

We have developed a model of the diffusion of actionable information and demonstrated how it can be used to study information cascades on Twitter. We identified various types of information requested or shared by the public during the disaster; showed how

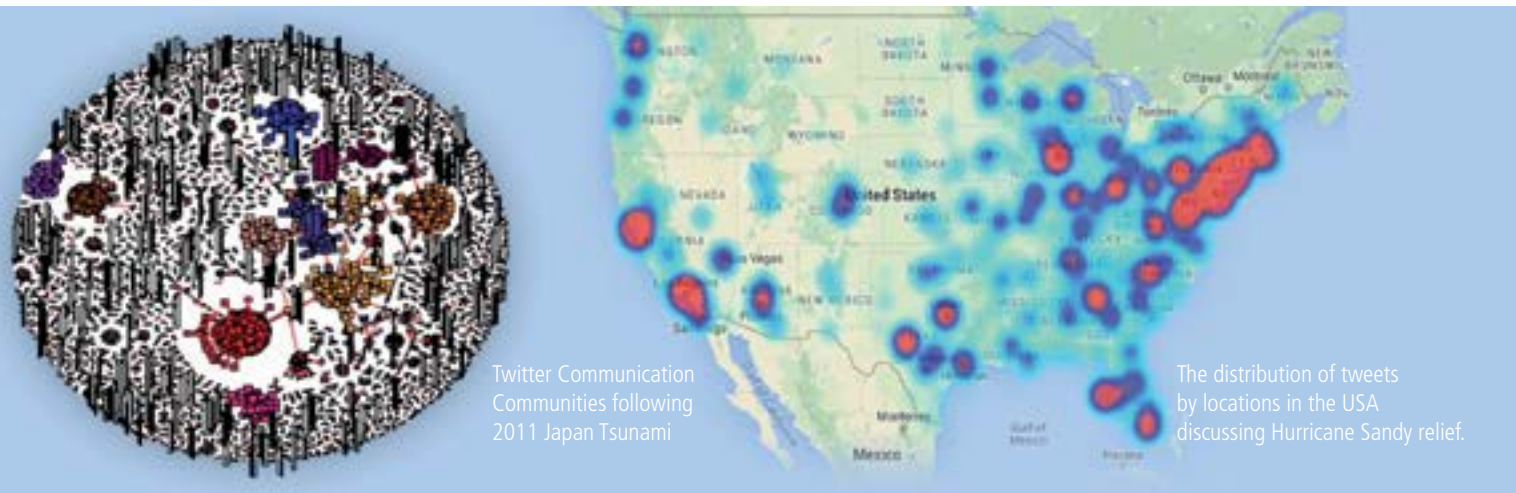
this information spreads among the users on Twitter including subsequent information cascades and/or patterns; and noted what these patterns tell us about information flow and the users. Emergency managers can use this information to either facilitate the spreading of accurate or impede the flow of inaccurate or improper information.

We analyzed two natural disasters—2011 Japan Tsunami and 2012 Hurricane Sandy to provide a better understanding of human behavior, collectively as part of virtual communities on Twitter and individually as leaders and members of those communities. Specifically, their behavior was evaluated by obtaining and propagating warning information, seeking and obtaining additional information and confirmations, and taking the prescribed action. The analysis employed a methodology showing how Natural Language Processing and Social Network Analysis (SNA) can be integrated to provide these results. We combined Natural Language Processing and Social Network Analysis (SNA) to extract actionable Twitter messages, constructing an actionable network, finding actionable communities, and determining the behaviors of the community members and their leaders. The findings suggest higher cohesion among the virtual community members

during 2011 Japan Tsunami than during 2012 Hurricane Sandy event. However, during both events members displayed agreement on required protective action (i.e. if some members were propagating messages to take action, the other members were taking action). Additionally, higher differentiation of leadership roles was demonstrated during 2012 Hurricane Sandy with stronger presence of official sources in leadership roles.

Our most recent research on social media and extreme events studies how the chatter on social media reflects real-life behavior. For example, during a disaster, there may be an extensive discussion of feelings toward the victims and possible ways to help the relief effort. Does all this chatter have any effect on how people react offline? We have used a simple theoretical model to suggest that if people who donate also announce on Twitter, then a contagion effect occurs resulting in a superlinear twitter to action scaling. We have empirically validated this suggestion, using location-paired tweets and donation values by U.S. states after the Hurricane Sandy.

*This material is based on work sponsored by the Army Research Lab, Department of Homeland Security, U.S. Department of Transportation, and National Science Foundation.*



## Designing Responsive Seabased Logistics Systems



Jennifer Pazour  
Assistant Professor

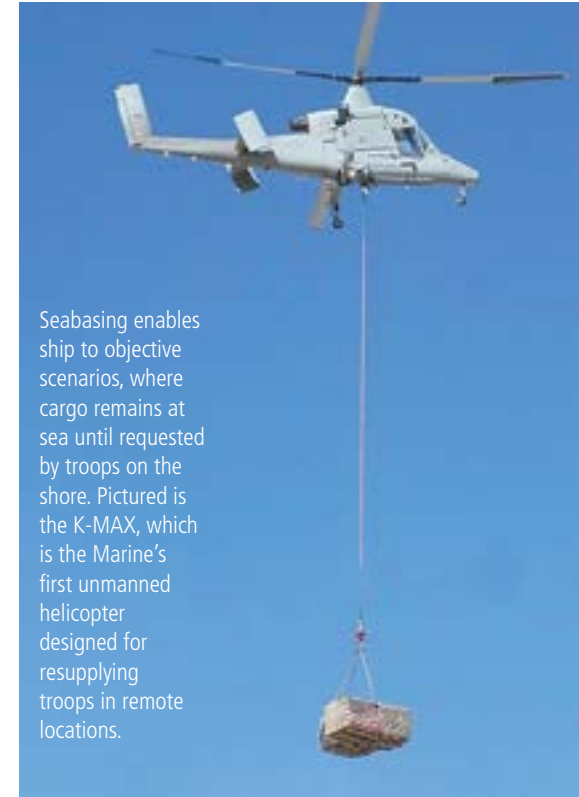
A military maritime logistics operation known as seabasing uses maritime platforms to transfer vital cargo stored on ships and rapidly deliver them ashore—effectively conducting logistics operations from the sea. Strategically, sea-basing provides flexibility in the ability to conduct a wide range of missions, including humanitarian aid distribution, crisis prevention, combat operations, and operational and tactical sustainment of military forces on the ground. Thus, the design of sea-based logistic delivery systems is critical to ensuring rapid transfer of these urgently needed deliveries. Sea-based logistics operate in a challenging environment and have unique mission characteristics. Thus, many logistics decisions are required to be made given imperfect visibility about the location, quantity, and expected delivery time of assets. For example, how should stowage, retrieval, loading, and unloading of supplies be conducted on ships to improve readiness and responsiveness?

To better understand, design, and operate sea-based logistics systems and processes, ISE researchers are developing mathematical representations and tools, including:

- (1) developing mathematical models that encompass the primary trade-offs in the system,
- (2) understanding structural properties and discovering solution approaches to solve the models, and
- (3) conducting computational experiments that use the developed models and approaches to provide policy recommendations and managerial insights.

Specifically, researchers are developing descriptive models to characterize and to understand how and why cargo holds evolve from a highly organized state to a disorganized state. Given imperfect information about the location, quantity, and expected delivery requests, researchers are also developing prescriptive models to determine which items, and in what quantity, should be pre-staged on the flight deck. The developed models and algorithms are being used to quantify and evaluate military sea-based logistic strategies for delivering emergent requests for tailored resupply packages in the presence of imperfect visibility. Ultimately, this research will lead to a better understanding of why sea-based logistics operate in an uncertain environment, will quantify the impact on logistics performance of operating in a complex and uncertain environment, will analyze the trade-offs associated with different logistics system design and policy alternative, and will determine logistics strategies that support the transfer of vital sea-based resources to forces ashore that considers operating in an environment with imperfect visibility.

*This research was funded by the Young Investigator Program from the Office of Naval Research.*



Seabasing enables ship to objective scenarios, where cargo remains at sea until requested by troops on the shore. Pictured is the K-MAX, which is the Marine's first unmanned helicopter designed for resupplying troops in remote locations.

(Photo courtesy of Lockheed Martin)



Dense storage cargo hold on board a T-AKE ship. The requirement to selectively offload only items requested in such a dense storage environment is challenging and trade-offs associated with responsiveness, storage density, and item visibility are being explored by ISE researchers.



## Communicating Ethical Perspectives: Does Native Language Matter?



William (Al) Wallace,  
Yamada Corporation  
Professor

The course *Ethics of Modeling for Industrial and Systems Engineering* introduces students to past, current, and future issues in the ethics of information technology, and encourages students to develop their own perspective. During the course, students learn about a wide range of ethical theories, and then apply them to address ethical dilemmas using computer simulation.

In fall 2015, a multidisciplinary team redesigned the course to address the proposition: “Conveying one’s ethical and moral values, can best be expressed in one’s native language.” The team consists of Professors Al Wallace and Ruth Murrugarra, a faculty member in ISE at Adolfo Ibáñez University in Santiago, Chile (and a former ISE student), Erica Blanco, ISE senior; and Rensselaer staff: Maureen Fodera, Josephine Seddon, and John Klucina. Topics in the course include theories of ethical decision-making, analysis of moral problems, and issues related to the introduction of information technology into society such as communication over the Internet, exchange of intellectual property, privacy, vulnerability of networked computers, software and computer reliability, workplace monitoring, telecommuting, and globalization.

Each team of three or four persons develops and presents two ethical situations (cases) based upon current events for class discussion. In addition, cases are assigned throughout the term for the students to assess and develop logical arguments based on appropriate ethical theories. SIMULATE, a set of computer-based cases with multiple roles and decisions, is also used in the course.

Professors Wallace and Murrugarra taught the course concurrently at their respective universities, at Rensselaer in English and at Adolfo Ibáñez University in Spanish. There are two teams that include both Chilean students, who work in Spanish, and American students, who work in English. The Schwartz Value Survey was administered at the beginning and at the end of the semester to analyze any differences in before/after interaction with students of a different culture.

Both Professor Wallace and Professor Murrugarra tested a series of different teaching methods in their native languages, including live lectures, interactive activities, pre-recorded lectures, and live demonstrations of software. In order for the students to navigate the language barrier, a hybridized classroom environment between Troy and Santiago was developed using multiple technology resources. Each faculty lectured in the native language of his/her classroom.

Remotely, students heard the same spoken lecture; but it was accompanied by a real-time translation that they can read in their own native language. To accomplish this, Professor Wallace wore a Bluetooth microphone to lecture in class, which was connected to a laptop that ran Dragon NaturallySpeaking, Adobe Connect, and Google Translate. As he spoke, the Dragon (speech recognition) software would dictate the words directly into Google Translate. Google Translate, in turn, would translate his English to Spanish almost instantaneously. The resulting translation would be shared via Adobe Connect and made viewable to the Chilean classroom. The same process was applied for Professor Murrugarra in Chile lecturing to Rensselaer students from Spanish to English. The first few times were a rollercoaster of trial and error dealing with issues such as Internet connectivity, software mishaps, and the technology learning curve. With the help of Rensselaer support personnel, the team has been able to develop and implement a workable system.

The goal for this course is for Rensselaer students and UAI students to work together on applying their learnings from lessons provided by both professors to case studies involving ethical situations and decision-making. They are working alongside each other on a large-scale project using Net Logo to simulate a situation that incorporates various ethical values and views. The motivation behind this collaboration is that, students’ conversations around their work will include the reasoning behind their ethical views and expose new ways of thinking to one another, and that working in one’s native language enhances their ability to communicate their values.



Spoken lectures are translated in real-time using Dragon Speak and Google Translate.

## Integrating Virtual Office Hours into the Undergraduate Industrial and Management Engineering Curriculum



Thomas Sharkey  
Associate Professor

Over the past few years, Professor Tom Sharkey has helped to create and integrate virtual office hours into the required undergraduate course ISYE 4600: *Operations Research (OR) Methods*. These virtual office hours are in the form of supplementary online content that provides an additional example of an OR concept and then an associated video tutorial that walks through the solution of the example. Professor Sharkey and

Dr. Sarah Nurre (DSES Ph.D. 2013) have created a total of 25 virtual office hours, which cover every major concept in ISYE 4600. This use of online content in the students’ learning experience is related to the growing trend of Massive Open Online Courses (MOOCs) but Professor Sharkey has uniquely blended the online content into ISYE 4600. The virtual office hours provide the benefits seen from MOOCs, such as their convenience and “on-demand” nature, while not taking away from the traditional classroom environment. The use of these virtual office hours have freed up class time to be dedicated to learning activities focusing on students gaining intuition about an OR concept prior to its formal presentation, which promotes a deeper understanding of these concepts.

The initial set of nine virtual office hours for OR Methods was created by Sarah Nurre, who is now an Assistant Professor at the University of Arkansas. Dr. Nurre received her Ph.D. from the department in 2013 and was interested in pursuing an academic career. She was able to gain valuable teaching experience in creating virtual office hours and helped her better prepare for educating today’s students. Currently, Orkun Baycik, a second-year Ph.D. student, is creating virtual office hours to support ISYE 4410: *Design and Analysis of Supply Chains*. This will make him more competitive on the academic job market since he will have cyber-based teaching experience. Therefore, not only do these virtual office hours impact the undergraduate students, they also better prepare our doctoral students for academic careers.

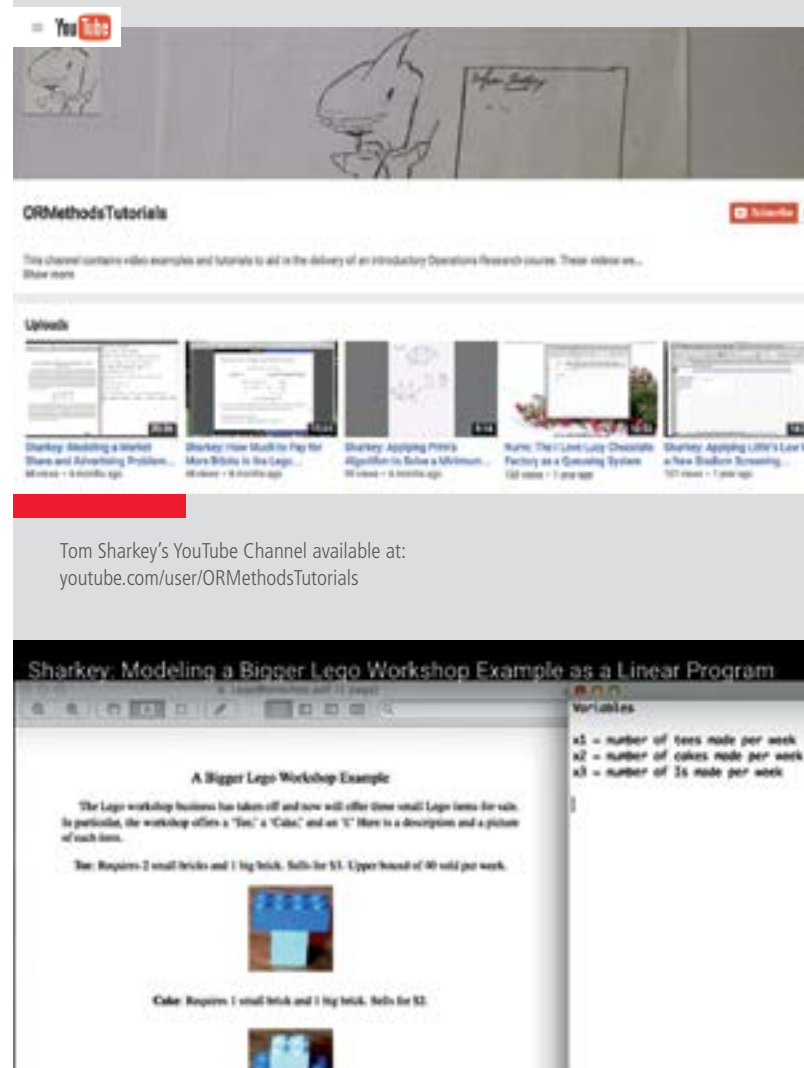
Professor Sharkey launched a YouTube Channel in Fall 2014 with these virtual office hours, which currently has over 8,000 views. In recognition of the impact of them, he received the 2012 Class of 1951 Outstanding Teaching Development Award, the 2015 School of Engineering Education Innovation Award, and the 2015 Rensselaer Alumni Association (RAA) Teaching Award. He plans to use the support from the RAA Teaching Award to help a Ph.D. student create virtual office hours for ISYE 4140: *Statistical Analysis*.



YouTube:  
[youtube.com/user/ORMethodsTutorials](https://youtube.com/user/ORMethodsTutorials)

Virtual Office Hours:  
[homepages.rpi.edu/~sharkt/ORMVideos.html](http://homepages.rpi.edu/~sharkt/ORMVideos.html)

Supply Chain Virtual Office Hours:  
[homepages.rpi.edu/~baycin/SCTutorials.html](http://homepages.rpi.edu/~baycin/SCTutorials.html)



Tom Sharkey’s YouTube Channel available at:  
[youtube.com/user/ORMethodsTutorials](https://youtube.com/user/ORMethodsTutorials)

Sample Virtual Office Hour for Modeling Decision-Making Environments with Linear Programs



## ISE Faculty and Students Recognized Through Major Awards

Tom Sharkey Honored with Multiple Awards and Promoted to Associate Professor with Tenure



Thomas C. Sharkey has been awarded the 2015 Rensselaer Alumni

Association Teaching Award. This Teaching Award was created in 1994 by the Rensselaer Alumni Association Board of Trustees and is designed to recognize current members of the Rensselaer faculty for their outstanding teaching techniques, contributions to the campus experience and commitment to students.

In addition, he received the 2015 School of Engineering Education Innovation Award and the 2015 ISE Faculty Award for Excellence. The ISE award recognizes and supports outstanding accomplishments in teaching, research, or advising of a members of the ISE faculty.

Professor Sharkey was also promoted to the Associate Professor rank with tenure in May 2015.

ISE Ph.D. Chris Gatti Awarded Springer Thesis Prize



Chris Gatti completed his Ph.D. under the mentorship of Professor Mark Embrechts. His

dissertation, "Design of Experiments for Reinforcement Learning," was awarded the Springer Thesis Prize, and will be published by Springer as part of the new Dissertation Series. Chris is also an outstanding gymnast and now works with Cirque du Soleil.

Wei Xie Won INFORMS Simulation Society Outstanding Publication Awards



Two papers co-authored by ISE faculty Wei Xie won the INFORMS Simulation Society 2015

Outstanding Publication Award: Barton, Russell R., Barry L. Nelson, and Wei Xie (2014). "Quantifying Input Uncertainty via Simulation Confidence Intervals," *INFORMS Journal on Computing* 26(1): 74-87. Xie, Wei, Barry L. Nelson, and Russell R. Barton (2014). "A Bayesian Framework for Quantifying Uncertainty in Stochastic Simulation," *Operations Research* 62(6): 1439-1452.

Jennifer Pazour Featured in WERC Sheet Outlook 2016



ISE Faculty Jennifer Pazour was invited by Warehouse Education and Research

Council (WERC) as one of five industry thought leaders to the WERC Sheet's Outlook 2016 panel to share her observations and insights on critical issues likely to impact the warehouse/distribution-center sector this year. Jennifer focused on the impact of the millennial generation on workforce and warehouse logistics technology. Her remarks are featured in the January/February 2016 issue of the WERC Sheet.

David Mendonça Serving as NSF Program Manager



Professor David Mendonça, is serving as director of the National Science

Foundation's program in Infrastructure Management and Extreme Events. Throughout this program's long history, it has supported foundational research on the interaction between human and technological systems in the context of hazard mitigation and disaster response. Mendonça is the first ISE faculty member to serve as an NSF program officer. His research has previously been supported by multiple NSF grants, including a CAREER award for his work on improvisation in emergency response.

Martha Grabowski Appointed to National Academies Boards



Martha Grabowski, McDevitt Distinguished Chair in Information

Systems at Le Moyne College and research faculty at Rensselaer, was appointed to the National Academies/National Research Council's Transportation Research Board/Marine Board. Grabowski is returning to the Board that she previously chaired. The National Research Council is the operating division of the National Academies, and is a private, non-profit institution. Under a Congressional charter granted to the National Academy of Sciences, the NRC provides scientific and technical advice to the government, the public and the scientific and engineering communities.

### IIE Student Chapter Honored



Chapter President: Eric Benaim



Advisor: Prof. Mohamed Aboul-Séoud

Rensselaer Institute of Industrial Engineers (IIE) Student Chapter won the Gold Award in 2015 for the seventh time in eight years!

The Chapter also presented a Green Belt short course in March 2015, a three-day program on process data collection and interpretation. Over 40 students participated and passed the Green Belt Six-Sigma certification.



Participants of the Green Belt Six-Sigma Short Course

## The Opportunity and Necessity for Measuring U.S. Health Care as a System— from an Engineering Viewpoint



Bill Foley  
Lecturer

The Organization for Economic Cooperation and Development (OECD) reported that in 2013, 17.1 percent of the U.S. gross domestic product was spent in health care. This is the highest percentage worldwide with the next highest, 11.6% , reported by France. While on a per capita basis the percent growth has slowed from 2.47 percent during 2003 to 2009 to 1.50 percent after 2009, the health care industry is expected to continue to grow with the Bureau of Labor Statistics predicting 10-year job growth (2012 to 2022) of 30 percent or greater for health care jobs.

The consumer patient sees health care as a series of encounters with many delays and waits, numerous requests for the same information, and billing and coverage determination notices often fraught with errors, mistakes, and coded messages about why or why not a service was paid. Their health care experience involves new pharmaceutical drugs with increasing out-of-pocket copayments and new high technology equipment that records or images their body for use by often unseen health

practitioners providing more data than ever before resulting in a diagnosis. The business processes and the process flows that define how they get care and how it is paid is their view of the system

This consumer view is the focus of practice of a cadre of health care engineers. In the November 2015 issue of *Industrial Engineer*, David Brandt in the article "The Waiting is the Hardest Part: Case Study, Solutions in Practice" reports on the progress made in the Head & Neck Center of the University of Texas MD Anderson Cancer Center on changes to the patient experience focused on the wait and scheduling practices followed. Miguel Lozano of the Office of Performance Improvement who led the project data analysis summarized the challenge that engineers face to implement changes to how physicians operate each day. "If you look at the training that physicians go through... they're trained to be very individualistic. They make decisions by themselves: they see the patient, each patient, in terms of a system, in terms of teamwork and all the roles that everybody plays in the process, it doesn't come very natural just based on their training and based on the way they work." The variation among and between patients and the wide range of highly skilled workers

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## Master of Engineering in Systems Engineering Offered in Pratt & Whitney, Maine

In 2015 the Office of Graduate Education teamed up with ISE to launch a customized graduate degree program focused on industrial process management for a select group of employees of Pratt & Whitney in North Berwick, Maine. The course is delivered online and on site, so students can earn a degree without significant disruption to their career. The cohort of 14 students began their coursework in summer 2015 and will graduate in the spring of 2017. Individuals who complete the prescribed course of study, including a master's project that is relevant to their current professional role, will be awarded a Master of Engineering degree in Systems Engineering and Technology Management (SETM).



## New Mexico Alumni Reception

Rensselaer Engineering Dean Shekhar Garde and ISE Head John Wen visited Albuquerque, New Mexico, in July 2015. An alumni reception was held together with the Sandia National Lab with alumni spanning 50 years. Director of the Sandia Lab, Dr. Paul Homert, 72, last day before his retirement, gave a welcome speech. Dean Garde described the latest initiatives and news in the School of Engineering. Prof. Wen described the strong connection between Rensselaer and New Mexico research institutions, including Sandia Labs, University of New Mexico, Air Force Research Lab, and Los Alamos National Lab







Ken Kinsley '56, The Kinsley Group,  
East Granby, Ct.

At a recent meeting with Dr. Wen, I commented that my Management Engineering studies at Rensselaer were the perfect education for my career path. Fifty years ago, eight years after graduating, I started a construction equipment business that evolved into the power systems group of businesses that exists today. I guess that means you can call me an entrepreneur, which is another way of saying someone who wants to do his own thing and probably has trouble taking directions from others. My wife would probably agree with that evaluation?

“Having a degree from Rensselaer opened many doors and answered many questions about our credibility as a company.”

As the company grew I discovered our strength was in the application of technical products such as generators and switchgear for alternative or emergency power. Our value added was designing and explaining electrical systems for emergency backup and prime power plus supplying trained technicians to service and repair them as required. I should also mention, if all else

fails, we maintain a fleet of rental equipment to back up the back up.

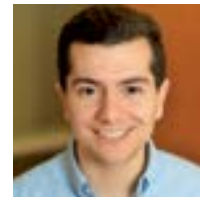
Now, you may ask, “How did a Management Engineering education help?” The management courses provided a basic understanding of accounting, marketing, personnel, law etc.—enough to know I should hire someone for each of the specialties and what to ask. The electrical and mechanical courses provided the ability to understand the applications and capabilities of the products we represent. Simply put, the combination of management and engineering studies trained me to understand and communicate effectively.

And, last but not least, having a degree from Rensselaer opened many doors and answered many questions about our credibility as a company. A Rensselaer degree is a good investment!

#### IME in NHL!



Scott Diebold signed a contract with the Louisiana Icegators. Congratulations to No. 35 Scott!



AJ Suleiman '14, Deloitte Consulting -  
Business Technology Analyst

Like most students, my time at Rensselaer was just as rewarding as it was challenging. I received my B.S. in Mechanical Engineering and, through the co-terminal program, received my M.E.

in Systems Engineering and Technology Management. I am currently a Business Technology Analyst at Deloitte Consulting and the one year of exposure to the ISE curriculum has had a very strong impact on my career so far. As a consultant, you are hired by various clients to tackle their most complex and ambiguous problems. Through the ISE curriculum, I learned how to both quantify and qualify these types of problems while simultaneously breaking them down to convey the most technical aspects to a business owner who is concerned with the solution. In my opinion, these are the most valuable skills that someone can have because they are adaptable to any aspect of your career and will continue to grow as your experience does.

I regularly interact with VP and C-Suite executives and, because of how the ISE curriculum is structured, I have the confidence to address their biggest concerns because of my strong problem-solving skillset and ability to convey technical solutions in a way that can be easily understood. Currently, my team is helping a well-known retailer build an eCommerce business from the ground up. On a previous project, we redefined a Fortune 500 cosmetic company's digital strategy for the next three years. These projects represent different industries and I have been the lead on different work streams within them, but have been able to excel because of how adaptable the skills I mentioned above are. Aside from the purely technical skills that I gained from my B.S. in Mechanical Engineering, the ISE curriculum has taught me how to use engineering in a way that allows me to solve technical issues surrounding real business problems, which I've found is rare and brings strong value to any situation.

“One year of exposure to the ISE curriculum has had a very strong impact on my career so far.”

cont.

engaged in service delivery to the patient complicates the application of systems improvement methodology. Efficient systems design under high variation is highly challenging.

There are many levels of systems analysis needed for health care. The foundation of such analysis needs measurement that reflects and summarizes variation in processes that are continuously changing. The sheer size of health care in the U.S. shows that engineering contribution to the debate and solution of measuring output and productivity is an economic necessity.

*Bill Foley is working with St. Peter's Health Partnership to investigate the effectiveness of medical scribe in physician's office. Dr. Foley led a team of two undergraduate researchers to collect data in a local primary care physician office. His work has been described in the local newspaper the Times Union.*

## ISE Class of 2015 Commencement Awards Winners



Dr. James Brooks



Dr. Chris Gatti



Jane Braun



Shoshanna Gabrielle  
Rubenstein

**The Del and Ruth Karger Dissertation Prize** is awarded to a DSES doctoral degree graduate in ISE whose doctoral dissertation is deemed outstanding.

#### Co-Winners:

Dr. James Brooks (GE Global Research Center) Dissertation Title: Dynamic Resource Allocation in Human Queueing Systems through Market-Based Control (Adviser: David Mendonça)

Dr. Chris Gatti (Cirque Du Soleil) Dissertation Title: Design of Experiments for Reinforcement Learning (Adviser: Mark Embrechts)

**The Ray Palmer Baker Prize (1937)** is established by bequest of Vjera C. Ricketts, widow of President Ricketts. It is awarded at Commencement to a senior in management engineering who has demonstrated outstanding ability in academic work and gives promise of outstanding professional success.

Winner: Jane Braun  
(Credit Suisse)

**Willie Stanton Award (1972)** is established by the Rensselaer Union, in honor of William P. (Willie) Stanton, Class of 1972 (hon.), a dishwasher and cook who served the academic and social needs of the Rensselaer students for over 45 years. It is presented annually to the senior who is judged to have contributed the most to the service of the student body.

Winner: Shoshanna  
Gabrielle Rubenstein  
(United Technologies)

## ISE welcomes new PhD students



Lu Cheng



Eric Meng



Shahab Mofidi



Lilian Ni



Aaron Rowan



Molly Renaud



Pu Zhang



Department of Industrial and Systems Engineering  
Rensselaer Polytechnic Institute  
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## IME Graduates Enjoy Outstanding Placements in 2015



Graduates of the IME program enjoyed another year of outstanding industry placements during 2015. Marquee corporate names appearing on this year's placement list include Exxon, Deloitte, Credit Suisse, General Electric, UTC, Goldman Sachs, W.L. Gore, Nestle, Schlumberger, Disney, L'Oreal, Bloomberg, and many other recruiters representing an impressively broad range of industries and economic sectors.