Curriculum Vitae

Wei Xie

Assistant Professor
Department of Industrial and Systems Engineering
Rensselaer Polytechnic Institute (RPI)
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My research interests focus on computer simulation, data analytics, data-driven stochastic optimization, risk and reliability management for complex cyber-physical systems with applications, including bio-pharmaceutical supply chains, smart power grids with renewable energy, blockchain, health care, semiconductor manufacturing, transportation infrastructure, and metal additive manufacturing. I currently serves as Associate Editor for *ACM Transactions on Modeling and Computer Simulation*.

Education

Northwestern University (NU), Evanston IL, USA

- Ph.D. Industrial Engineering and Management Sciences June 2014
  - Dissertation Title: Statistical Uncertainty Analysis for Stochastic Simulation
  - Advisors: Barry L. Nelson, Russell R. Barton

University of Nebraska-Lincoln, Lincoln NE, USA

- M.S. Engineering Mechanics Aug. 2005
  - Thesis Title: Peridynamic Flux-Corrected Transport Algorithm for Shock Wave Studies
  - Advisor: Florin Bobaru
- Minor: Electrical Engineering

Yangtze University, Jingzhou China

- B.S. Mechanical Engineering June 1997

Honors and Awards

- My two papers, "A Bayesian Framework for Quantifying Uncertainty in Stochastic Simulation" published at *Operations Research* and "Quantifying Input Uncertainty via Simulation Confidence Intervals" published at *INFORMS Journal on Computing*, with Barry L. Nelson and Russell R. Barton, received the 2015 Outstanding Publication Award from the INFORMS Simulation Society.
- My Ph.D. student, Bo Wang, received the 2017 INFORMS Best Student Paper Finalist Award from Quality, Statistics and Reliability (QSR) Section. This award is to recognize the research excellent among INFORMS student members.
- My Ph.D. student, Yuan Yi, is a single winner of 2017 RPI Industrial and Systems Engineering (ISE) research award. This award is to recognize the research excellent among RPI ISE graduate students.

Technical Publication

*J*ournal Papers (JP)

JP19. Xie, W.[1], P. Zhang[2], R. Chen, Z. Zhou (2017). A Nonparametric Bayesian Framework for Short-Term Wind Power Probabilistic Forecast, under the third-round review for *IEEE Transactions on Power Systems*.

JP18. Xie, W.[1], C. Li, P. Zhang[2] (2017). A Bayesian Nonparametric Hierarchical Framework for Uncertainty Quantification in Simulation, under the third-round review for *Operations Research*.

JP17. Xie, W.[1], C. Li, P. Zhang[2] (2017). A Factor-Based Bayesian Framework for Risk Analysis in Large-Scale Stochastic Simulations, *ACM Transactions on Modeling and Computer Simulation*, Vol. 27, Issue 4.

JP16. Yi, Y.[2], W. Xie[1] (2017). A Metamodel-Assisted Framework for Two-stage Optimization with Stochastic Simulation, submitted to *INFORMS Journal on Computing*.

JP15. Wang, B.[2], Q. Zhang, W. Xie[1] (2017). Bayesian Sequential Data Collection for Simulation Calibration Using Detailed Sample Paths, under the second-round review for *European Journal of Operational Research*.

JP14. Yi, Y.[2], W. Xie[1] (2017). An Efficient Budget Allocation Approach for Quantifying the Impact of Input Uncertainty in Stochastic Simulation, *ACM Transactions on Modeling and Computer Simulation*, Vol. 27, Issue 4.

JP13. Xie, W.[1], B. L. Nelson[3], R. R. Barton[3] (2016). Multivariate Input Uncertainty in Output Analysis for Stochastic Simulation, *ACM Transactions on Modeling and Computer Simulation,* Vol. 27, Issue 1, No.5.

JP12. Bostanabad, R., A. T. Bui, W. Xie, D. W. Apley, W. Chen (2016). Stochastic Microstructure Characterization and Reconstruction via Supervised Learning. *Acta Materialia,* Vol. 103, pp 89-102.

JP11. Vishvanathan, V., L. Hollebeek, E. Malthouse, E. Mashowska, S. J. Kim, W. Xie (2017). The Dynamics of Consumer Engagement with Mobile Technologies. *Service Science*, Vol. 9, pp 36-49.

JP10. Xie, W., B. L. Nelson[3], R. R. Barton[3] (2014). A Bayesian Framework for Quantifying Uncertainty in Stochastic Simulation. *Operations Research,* Vol. 62, No. 6, pp. 1439-1452.

JP9. Barton, R. R.[3], B. L. Nelson[3], W. Xie (2014). Quantifying Input Uncertainty via Simulation Confidence Intervals. *INFORMS Journal on Computing,* Vol. 26, No. 1, pp. 74-87.

JP8. Pei, J., D. Klabjan[3], W. Xie (2013). Approximations to Auctions of Digital Goods with Share-averse Bidders. *Electronic Commerce Research and Applications,* Vol. 13, No. 2, pp. 128-138.

JP7. Al-Qadi, I.L.[3], W. Xie, R. Roberts (2010). Optimization of Antenna Configuration in Multiple-frequency Ground Penetrating Radar System for Railroad Substructure Assessment. *NDT & E International,* Vol. 43, No. 1, pp. 20-28.

[1]Denotes the corresponding author
[2]Denotes my Ph.D. students
[3]Denotes my former advisor

JP6. Al-Qadi, I.L.[3], W. Xie, D.L. Jones, R. Roberts (2010). Development of a Time-Frequency Approach to Quantify Railroad Ballast Fouling Condition Using Ultra-Wide Band Ground-Penetrating Radar Data. *International Journal of Pavement Engineering,* Vol. 11, No. 4, pp.269-279.

JP5. Al-Qadi, I.L.[3], W. Xie, R. Roberts, Z. Leng (2010). Data Analysis Techniques for GPR Used for Assessing Railroad Ballast in High Radio-Frequency Environment, *Journal of Transportation Engineering,* Vol. 136, No. 4, pp.392-399.

JP4. Al-Qadi, I.L.[3], W. Xie, M.A. Elseifi (2008). Frequency Determination from Vehicular Loading Time Pulse to Predict Appropriate Complex Modulus in MEPDG. *Journal of the Association of Asphalt Paving Technologists*, Vol. 77, pp.739-772.

JP3. Al-Qadi, I.L.[3], W. Xie, R. Roberts (2008). Scattering Analysis of Ground-Penetrating Radar Data to Quantify Railroad Ballast Contamination. *Journal of Nondestructive Testing and Evaluation,* Vol. 41, No. 6, pp.441-447.

JP2. Al-Qadi, I.L.[3], W. Xie, R. Roberts (2008). Time-Frequency Approach for Ground Penetrating Radar Data Analysis to Assess Railroad Ballast Condition. *Research in Nondestructive Evaluation*, Vol. 19, No. 4, pp.219-237.

JP1. Xie, W., J. Xie[3] (2003). Design of Mechanism Morphology and Mass Distribution for Control. *Machine Design and Research*, Vol. 19, No. 1, pp.31-33. (in Chinese)

*C*onference Papers (CP)

CP20. Xie, W.[1], B. Wang[2], Q. Zhang (2018). Metamodel-Assisted Risk Analysis for Stochastic Simulation with Input Uncertainty. *Proceedings of the 2018 Winter Simulation Conference.*

CP19. Yi, Y.[2], W. Xie[1], Z. Zhou (2018). Simulation-based Stochastic Programming for Real-Time Scheduling of Power Grids under Cyberattacks. *Proceedings of the 2018 Winter Simulation Conference.*

CP18. Xie, W.[1], P. Zhang[2], I. Ryzhov (2018). A Simulation-Based Prediction Framework for Stochastic System Dynamic Risk Management. *Proceedings of the 2018 Winter Simulation Conference.*

CP17. Xie, W.[1], P. Zhang[2], Q. Zhang (2017). A Stochastic Simulation Calibration for Real-Time System Control. *Proceedings of the 2017 Winter Simulation Conference.*

CP16. Zhang, Q. and W. Xie (2017). Asymmetric Kriging Emulator For Stochastic Simulation. *Proceedings of the 2017 Winter Simulation Conference.*

CP15. Wang, B.[2], Q. Zhang, W. Xie[1] (2017). Bayesian Sequential Calibration Using Detailed Sample Paths. *Proceedings of the 2017 Winter Simulation Conference.*

CP14. Xie, W.[1], Y. Yi[2] (2016). A Simulation-Based Prediction Framework for Two-Stage Dynamic Decision Making. *Proceedings of the 2016 Winter Simulation Conference.*

CP13. Xie, W.[1], C. Li, H. Sun[2] (2015). Quantification Input Uncertainty for Dependent Input Models with Factor Structure. *Proceedings of the 2015 Winter Simulation Conference.*

CP12. Yi, Y.[2], W. Xie[1], E. Zhou (2015). A Sequential Experiment Design for Input Uncertainty Quantification in Stochastic Simulation. *Proceedings of the 2015 Winter Simulation Conference.*

CP11. Zhou, E., W. Xie (2015). Simulation Optimization when Facing Input Uncertainty. *Proceedings of the 2015 Winter Simulation Conference.*

CP10. Xie, W.[1], B. L. Nelson[3], R. R. Barton[3] (2014). Statistical Uncertainty Analysis for Stochastic Simulation with Dependent Input Models. *Proceedings of the 2014 Winter Simulation Conference.*

CP9. Xie, W., B. L. Nelson[3], J. Staum (2010). The Influence of Correlation Functions on Stochastic Kriging Metamodels. *Proceedings of the 2010 Winter Simulation Conference.*

CP8. Barton, R. R.[3], B. L. Nelson[3], W. Xie (2010). A Framework for Input Uncertainty Analysis. *Proceedings of the 2010 Winter Simulation Conference.*

CP7. Al-Qadi, I.L.[3], R. Roberts, E. Tutumluer, Z. Leng, W. Xie (2009). New Ground Penetrating Radar Analysis Techniques for Ballast Assessment. *Technology Digest* TD-09-028. AAR, TTCI, Pueblo, CO, USA.

CP6. Al-Qadi, I.L.[3], W. Xie, R. Roberts (2008). Scattering Analysis of Railroad Ballast Using Ground-Penetrating Radar. *Transportation Research Board (TRB) 87th Annual Meeting.*

CP5. Beak, J., I.L Al-Qadi[3], W. Xie, W.G. Buttler (2008). In-Situ Assessment of Interlayer Systems to Abate Reflective Cracking in Hot-Mix Asphalt Overlays. *Transportation Research Board (TRB) 87th Annual Meeting.*

CP4. Al-Qadi, I.L.[3], W. Xie, R. Roberts (2007). Flaw Quantification of Railroad Ballast: A New Analysis Approach of Ground Penetrating Radar's Reflection Data. *Transportation Research Board (TRB) 86th Annual Meeting.*

CP3. Popovics, J., N. Ryden, A. Gibson, I.L. Al-Qadi[3], D.S. Alzate, W. Xie (2007). New Developments in NDE Methods for Pavements. *AIP Conference Proceedings.*

CP2. Xie, W., I.L. Al-Qadi[3], R. Roberts, E. Tutumluer, J. Boyle (2006). Quantification of Railroad Ballast Condition Using Ground Penetrating Radar Data. *6th International NDE Conference on Civil Engineering.*

CP1. Al-Qadi, I.L.[3], J.S. Popovics, K. Jiang, W. Xie, G.P. Getrangolo (2006). Structural Assessment of Kingery Bridge Piers Using Combined Nondestructive Testing Methods. *6th International NDE Conference on Civil Engineering.*

*W*orking Papers (WP)

WP8. Yi, Y.[2], W. Xie[1], Z. Zhou. Data-Driven Stochastic Optimization for Power Grids Scheduling under High Wind Penetration, to be submitted to *IEEE Transactions on Power Systems.*

WP7. Yi, Y.[2], W. Xie[1], A. Tajer, J. Chow. Robust Real-Time Dispatch for Smart Power Grids Countering Cyberattacks, to be submitted to *IEEE Transactions on Power Systems.*

WP6. Zhang, Q., B. Wang[2], W. Xie. Asymptotic Representation for Value-at-Risk of Pooled Detailed Sample Paths from Stochastic Simulation, to be submitted to *Operations Research Letters.*

WP5. Wang, B.[2], W. Xie[1], Z. Zhou. Nonparametric Spatial-Temporal Wind Power Probabilistic Forecasting, working paper.

WP4. Yi, Y.[2], J. Hu, W. Xie[1]. Stochastic Optimization with Input Uncertainty: a Mean-Risk Newsvendor Problem, to be submitted to *European Journal of Operational Research.*

WP3. Xie, W.[1], B. L. Nelson[3], R. R. Barton[3]. Statistical Uncertainty Analysis for Stochastic Simulation, working paper.

WP2. Chan, W. K., W. Xie, Y. Yi[2], P. Zhang[2]. Multi-Objective Scheduling of Cluster Tools in Semiconductor Production, working paper.

WP1. Akcay, A. E., Gunes Corlu, C., W. Xie. A Survey of Input Uncertainty in Stochastic Simulation, working paper.

Current and Previous Students

- **Ph.D. Students**
  - Pu Zhang, June 2015 – Summer 2018 (finished three journal papers and two Winter Simulation Conference papers; 2017 summer intern at Goldman Sachs; received a job offer from Goldman Sachs; passed the candidacy exam)
    - Thesis Title: Data Analytics and Simulation Methodologies for Adaptive Supply Chain Risk Management in Bio-Pharmaceutical Manufacturing.
  - Yuan Yi, October 2014 – Summer 2018 (finished three journal papers and three Winter Simulation Conference papers; 2017 summer intern at Argonne National Laboratory; single winner of 2017 RPI Industrial and Systems Engineering research award; passed the candidacy exam)
    - Thesis Title: Data-Driven Stochastic Optimization for Reliability Management: Smart Power Grids with Renewable Energy.
  - Bo Wang, August 2016 – present (finished two journal papers and two Winter Simulation Conference papers; finalist for 2017 INFORMS best student paper on Quality, Statistics and Reliability; 2018 summer intern at Argonne National Laboratory; expected graduation time: December 2019)
    - Potential Thesis Title: Artificial Intelligence and Simulation Methodologies: Blockchain Development for Biopharma Supply Chain Risk Management.
  - Yan Chu, June 2018 – present
    - Research Topic: Data Analytics and Reinforcement Learning for Smart Power Grids Control and Cybersecurity.
- **Undergraduate Research Projects**
  - Chuyun Liu, Project title "Research to Education on Biopharma Supply Chain Risk Management."

Research Experience

- Project: "Improved Supply Chain Management at Regeneron", supported by Regeneron Pharmaceutical Company, 100% PI, $90,000, July 2015 - December 2016.
- *Data-Driven Risk Management for End-to-End Supply Chains in Biopharmaceutical Manufacturing* October 2014 – present
  - Supply chain management in biopharma manufacturing faces various challenges, including long lead times, limited available raw materials, frequent launches of new products, high uncertainty in supply, testing, production, and demand. At the same time, rich data from internet-connected data collection devices have the potential to provide the current physical and knowledge status of research development, supply chain and production process. To deal with these challenges, we consider "an end-to-end supply chain" that integrates the supply chain risk management with new product research development and production process. We develop a simulation-based prediction framework to guide *coherent* real-time decision making in inventory control, testing and production scheduling, which can hedge against various sources

of uncertainty in clinical trials, supply, testing, and production. We introduce a simulation-based two-stage optimization approach for capacity planning. To control the impact of supply volatility and efficiently employ key raw materials and facilities, we are proposing a new scenario-based scheduling for testing and production. Therefore, our data analytics and simulation methodologies enable us to construct an end-to-end supply chain that can speed up the time to market, improve the system reliability and the overall profit.

- *Data-Driven Reliability Management for Smart Power Grids with Renewable Energy* (with Joe H. Chow and Zhi Zhou) February 2017 – present
  - To improve energy system resilience and cost-efficiency, we are developing new data analytics and data-driven stochastic optimization methodologies to guide strategic and real-time operational decisions for smart power grids with renewable energy, e.g., wind and solar. We propose a Bayesian framework that can guide the power grid scheduling and adaptively control the operating reserves to hedge against various sources of uncertainty on both demand and supply sides. To support the real-time risk management, we propose a flexible wind forecast model, and further introduce a rigorous prediction risk quantification. In addition, we develop a new data-driven stochastic optimization approach accounting for the system inherent stochastic uncertainty, the forecast model estimation uncertainty, and the finite sampling error from the sample average approximation (SAA) to dynamically find the optimal unit commitment and economic dispatch. Our methodologies demonstrate better and more robust performance than existing wind forecasting and stochastic programming approaches in the energy literature.
- *Cybersecurity for Smart Power Grids with High Solar and Wind Energy Penetration* (with Joe H. Chow, Koushik Kar, Ali Tajer) January 2018 – present
  - To secure a sustainable energy future, solar and wind energies become more and more penetrated into power grids, which could lead to large uncertainty to the whole power system. With the advent of ICT, the power grid has transformed into a cyber-enabled ensemble of networked devices and intelligent communication protocols, which allows us to make adaptive operational decisions hedging against the uncertainty. However, this cyber-enable smart platforms is intrinsically susceptible to cyberattacks. To enable reliable, resilient and efficient energy generation, transmission and distribution, we develop novel data analytics, stochastic optimization and communication networking methodologies to counter cyberattacks.
- *Autonomous Additive Manufacturing (AM) for Laser-Based Metal Power-Bed Fusion Process* (with Johnson Samuel and Sandi Mishra) December 2017 – present
  - We are developing an autonomous metal additive manufacturing system so that it can automatically find the optimal material processing conditions to achieve the desired product quality. Since the interactions between the material micro-structure and the thermal processing conditions are not well-understood, the simulation prediction can introduce the model risk. Given rich data streams from in-situ sensing and simulation experiments, we first develop data and simulation analytics that can extract the information from all sources of historical data and improve our understanding on the relationships between the thermal processing and the material microstructure. Then, we propose a Bayesian prediction framework for the product quality accounting for the model risk. After that, we introduce a data-driven stochastic optimization that can efficiently guide the real-time experiments for both physical

and simulation systems with decisions depending on partially observed physical and knowledge states, e.g., the current micro-structure and the input-output relation.

- *Blockchain Risk Management* (with Hong Wan and Wencen Wu) March 2018 – present
  - Simulation can be used to guide the blockchain decision making. We are developing new simulation methodologies to improve the blockchain safety and scalability.
- *Production Scheduling and Control in Semiconductor Manufacturing* October 2016 – present
  - For a complex semiconductor production system, a simulation model can be used to guide real-time production scheduling and control. To provide reliable decision guidance, we propose an innovative calibration framework so that the calibrated simulation model can predict the future outputs for the real system. It can deliver credible intervals for calibration parameters and prediction intervals for future outputs of the real system accounting for the model risk and the system inherent stochastic uncertainty. Our approach can be used for real-time system diagnostics and control. It will enable the construction of reliable and cost-efficient semiconductor production systems.
- *Statistical Uncertainty Analysis for Stochastic Simulation* (with Barry L. Nelson and Russell R. Barton) June 2011 – present
  - Supported by National Science Foundation
  - When we use simulation to evaluate the performance of a stochastic system, the simulation often contains input models estimated from real-world data. There are both simulation and input uncertainties in the system performance estimate. To make effective use of the simulation budget, we proposed both frequentist and Bayesian approaches to quantify the overall uncertainty of the system performance estimate. They are supported by rigorous theoretical analysis and demonstrate good finite-sample performance.
- *Data Analytics and Signal Processing for Transportation Infrastructure Maintenance* (with Imad L. Al-Qadi) August 2005 – Dec. 2007
  - Supported by Federal Railroad Administration and Department of Transportation
  - To provide a fast and reliable evaluation over transportation infrastructure, e.g., pavements, bridges, and railroads, we developed a nondestructive testing system, including Ground Penetrating Radar (GPR) with various frequency antennae, to obtain comprehensive subsurface information. To automatically process the ultra-wideband sensor data, we proposed new data analytics and signal processing approaches. On-site samples exhibited reliable performance of our approaches in assessing the infrastructure quality status.
- *Marketing Analytics* (with Edward C. Malthouse) July 2013 – June 2014
  - The emergence of modern information and communication technologies including social media platforms, mobile devices and applications (apps) offers a multiplicity of touch points to engage customers with particular brands. By analyzing customer data from a well-known coalition loyalty program called the Canadian Air Miles Reward Program, we glean insights about how customer engagement through mobile apps affects the customer purchasing behavior. We employ a vector-autoregressive (VAR) model to account for the dynamic interactions among non-purchase customer engagement behaviors (i.e., app usage), purchase and consumption. The information extracted from our study can help marketers adjust their marketing strategy and improve their marketing effectiveness.

- *Approximate Dynamic Programming in Complex Multi-Echelon Inventory and Production Systems* (with Diego Klabjan) January 2008 – Aug. 2009
  - Supported by National Science Foundation
  - The goal of this project is to study the solution methodologies for general multi-echelon systems with stochastic lead-times, economies of scale, transportation capacities, and demand occurring in each stage of the system. Approximate dynamic programming was used to obtain shipping policies. Since the computation time can increase prohibitively for complex supply chain systems, various parallel algorithms based on Message Passing Interface were proposed to speed up the computation time.
- *Damage and Fracture with Peridynamics* (with Florin Bobaru) August 2003 – June 2005
  - The peridynamic formulation is a novel reformulation of the classical continuous mechanics theory and has strong ties with molecular dynamics models. This method leads to a meshfree implementation able to successfully model complicated fracture and fragmentation patterns at impact, spallation, etc. To simulate shock waves, the Flux-Corrected Transport technique was implemented in the peridynamic method leading to the Peridynamic Flux-Corrected Transport algorithm. This method can efficiently eliminate the high frequency oscillation behind the shock wave fronts and overcome limitations in the Finite Element Flux-Corrected method.

Teaching Experience

Rensselaer Polytechnic Institute

- Teaching
  - ISYE 4290/6620 Discrete-Event Simulation Modeling Fall 2017
  - ISYE 4210/6600 Design of Manufacturing Systems and Supply Chains Spring 2016,2017,2018
  - ISYE 4140 Statistical Analysis Fall 2014 - Fall 2015

Northwestern University

- Co-teaching
  - IMC 451 Statistics and Marketing Research Fall 2013

Presentations

- Data-Driven Stochastic Optimization for Power Grids Scheduling under High Wind Penetration, Technical Conference: Increasing Real-Time and Day-Ahead Market Efficiency and Enhancing Resilience through Improved Software, hosted by Federal Energy Regulatory Commission, Washington D.C., June 2018.
- A Stochastic Simulation Calibration Framework for Real-Time System Control, Winter Simulation Conference, Las Vegas, NV, December 2017.
- A Simulation Optimization for Two-Stage Decision Making, INFORMS Annual Meeting, Houston, Texas, October 2017.
- A Simulation Calibration Framework for the Production Control, INFORMS Annual Meeting, Houston,Texas, October 2017.

- A Stochastic Simulation Calibration Framework for the Production Control, SRC conference, Piscataway, New Jersey, May 2017
- A Simulation-Based Prediction Framework for Two-Stage Dynamic Decision Making, Winter Simulation Conference, Washington, D.C., December 2016.
- Quantification Input Uncertainty for Dependent Input Models with Factor Structure, Winter Simulation Conference, Huntington Beach, CA, December 2015.
- An Efficient Design of Experiments for Stochastic Simulation: Quantifying Input Uncertainty, INFORMS Annual Meeting, Philadelphia, PA, November 2015.
- Statistical Uncertainty Quantification for Stochastic Simulation with Dependent Input Models, Albany Chapter of the American Statistical Association, Albany, NY, May 2015.
- A Bayesian Framework for Statistical Uncertainty Quantification in Stochastic Simulation, CSE Seminar at Rensselaer Polytechnic Institute, Troy, NY, May 2015.
- Statistical uncertainty analysis for stochastic simulation with dependent input models, Winter Simulation Conference, Savannah, GA, Dec. 2014.
- Multivariate input uncertainty in output analysis for stochastic simulation, INFORMS Annual Meeting, San Francisco, Nov. 2014.
- A Bayesian framework for quantifying uncertainty in stochastic simulation, INFORMS Annual Meeting, San Francisco, Nov. 2014.
- Modeling the effect of engagement and disengagement with mobile apps on customer purchase behavior, Marketing EDGE Professor's Institute, Cincinnati, Jan. 2014.
- Statistical uncertainty analysis for stochastic simulation, INFORMS Annual Meetings, Mineapolis, Oct. 2013.
- The influence of correlation functions on stochastic kriging metamodels, Winter Simulation Conference, Baltimore, Dec. 2010.
- Approximate dynamic programming for serial multi-echelon system with economies of scale, INFORMS Annual Meeting, Washington DC, Oct. 2008.
- Development of a time-frequency approach to quantify railroad ballast fouling condition using UWB GPR data, Transportation Research Board, Washington DC, 2008.
- Scattering analysis of railroad ballast using ground penetrating radar, Transportation Research Board, Washington DC, 2007.
- Quantification of Railroad Ballast Condition Using Ground Penetrating Radar Data, 6th International NDE Conference on Civil Engineering, St. Louis, 2006.

Service and Memberships

External Professional Activities

- Associate Editor for *ACM Transactions on Modeling and Computer Simulation*
- Co-chair for the Analysis Methodology track for 2019 Winter Simulation Conference

- Track-Coordinator for the Analysis Methodology track for 2018 Winter Simulation Conference
- Organizer for symposium on "Simulation Analysis Methodologies for Decision Making in Smart Manufacturing", 2019 ASME International Manufacturing Science & Engineering Conference (MSEC)
- Session Organizer for 2018 Joint Statistical Meetings (JSM)
- Session Chair for 2018 INFORMS Annual Meeting - Simulation Optimization Session
- Session Chair for 2017 Winter Simulation Conference (WSC)
- WSC Diversity Committee and Chair (2015 - 2018)

Internal Professional Activities

- Graduate committee — Spring 2017 - present
- Undergraduate committee — Fall 2015 - Spring 2016
- Undergraduate advisor for 2019 class — Fall 2015 - Spring 2016
- Ph.D. thesis committee chairman
  - Yuan Yi, Department of Industrial and Systems Engineering at RPI, thesis "Data-Driven Stochastic Optimization for Reliability Management: Smart Power Grids with Renewable Energy."
  - Pu Zhang, Department of Industrial and Systems Engineering at RPI, thesis "Data Analytics and Simulation Methodologies for Adaptive Supply Chain Risk Management in Bio-pharmaceutical Manufacturing."
- Ph.D. thesis committee
  - Jie You, Computer System Engineering at RPI, thesis "Cooperative Filtering, Identification, and Mapping for Spatially Distributed Systems Using Mobile Sensor Networks."
  - Hari Prasadh, Industrial and Systems Engineering at RPI, thesis "Design of Experiments for Nonlinear Regression Models without using Prior Point Parameter Estimates."

Referee

Management Science

Operations Research

European Journal of Operational Research

INFORMS Journal on Computing

ACM Transactions on Modeling and Computer Simulation

IEEE Transactions on Power Systems

Statistical Analysis and Data Mining

Automatica

International Journal of Production Research

Naval Research Logistics

Journal of Simulation

Proceedings of the Winter Simulation Conference

Computers and Operations Research

Member

Institute for Operations Research and The Management Sciences (INFORMS)

Transportation Research Board (TRB)

Work Experience

General Motors

- Summer Intern 2011
  - *Product Content Planning, Packaging and Pricing Project*
    The objective of our project is to integrate customer preferences into an optimization framework to identify new vehicle content, packaging alternatives, and prices, to improve program aggregate contribution margin (ACM) and share. The customer preferences that drive the analysis are estimated using clinic data from a choice-based conjoint analysis. There are various sources of uncertainty in estimating the customer preferences. We identified these sources, and proposed different approaches to correctly and effectively propagate the part of estimation error which can be quantified to uncertainty about program ACM and share. This allows us to judge whether the expected performance under a certain decision setting is statistically significantly better than under another setting.

San Diego Supercomputer Center

- Summer Intern 2008
  - Supported by *Cyberinfrastructure Experiences for Graduate Students (CIEG) supplement funding*
    Proposed and implemented various parallel approaches to find good shipping policies for complex multi-echelon inventory and production systems.

Chengdu Construction Machinery (Group) Co.

- Quality Supervisor 1997–1999
  - Control production quality on assembly lines
  - Coordinate quality issues across different departments