

# ASHESH KUMAR SINHA

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## EDUCATION

**University of Wisconsin-Madison**, August 2016

Ph.D. in Industrial Engineering

Dissertation: Stochastic Models for Strategic Sourcing in Energy Industry.

Optimize production and sourcing strategies for knowledge-type and standard-type components.

Funded by National Oilwell Varco and involves multi-university collaboration.

Minor, Computer Science, May 2014

M.S., Manufacturing Systems Engineering, May 2014

**Indian Institute of Technology, Kharagpur, India**

B.Tech, Industrial Engineering, May 2011 (with best B.Tech project award)

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## PROFESSIONAL EXPERIENCE

**Assistant Professor**, Global Supply Chain Management, John Chambers College of Business and Economics  
West Virginia University, Morgantown, August 2023 - Present

**Assistant Professor**, Department of Industrial and Manufacturing Systems Engineering  
Kansas State University, Manhattan, August 2017 - August 2023

**Optimization Engineer II**, Central Engineering  
Schneider National, Green Bay, August 2016 - July 2017

**Research Assistant**, Department of Industrial and Systems Engineering  
University of Wisconsin-Madison, Madison, August 2011 - August 2016

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## RESEARCH INTERESTS

**Methodology** Stochastic optimization, game theory, data analytics

**Applications** Supply chain management, energy industry, transportation logistics

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## JOURNAL PUBLICATIONS

- J1 Toloioe, A., **Sinha, A.K.** and Nouri, A.K.R. 2024. Heuristic approach for optimizing reliable supply chain network using drones in last-mile delivery under uncertainty. *International Journal of System Science: Operations and Logisitcs*. 11(1).
- J2 Maleki, M. and **Sinha, A.K.** 2023. An Efficient Model and a Heuristic for the Multiple Allocation Hub Maximal Covering Problem. *Optimization Method and Software*. 38(2), 1-22.
- J3 Shami, A. and **Sinha, A.K.** 2022. Simulation Based Model for Component Replenishment in Multi-Product ATO Systems with Shared Resources. *International Journal of Modeling and Simulation*. 43 (6), 864-878.
- J4 Das, J., Tiwari, M.K., **Sinha, A.K.** and Khanzode, V. 2022. Integrated warehouse assignment and carton configuration optimization using deep clustering-based evolutionary algorithms. 2022. *Expert Systems with Applications*. 212.
- J5 Maity, M., Toloioe, A., **Sinha, A.K.**, and Tiwari, M.K. 2021. Optimization of batch dispersion model and integration with blockchain. *Computers and Industrial Engineering*, 154, 107134.
- J6 Kappelman, A. and **Sinha, A.K.** 2021. Optimal Control in Dynamic Food Supply Chains using Big Data. *Computers and Operations Research*, 126, 105117.

- J7 Toloioe, A., Maity, M. and **Sinha, A.K.** 2020. A two-stage stochastic mixed-integer program for reliable supply chain network design under uncertain disruptions and demand. *Computers and Industrial Engineering*, 148, 106722.
- J8 **Sinha, A.K.** and Krishnamurthy, A. 2020. Production and Capacity Utilization Strategies in Supply Chain for Complex Engineered Products. *Production and Operations Management*, 29(2), 462-480.
- J9 Delli, U. and **Sinha, A.K.** 2019. Parallel Computation Framework for Optimizing Trailer Routes in Bulk Transportation. *Journal of Industrial Engineering International*, 15(3), 487-497.
- J10 Gifford, T., Opicka, T., **Sinha, A.K.**, Gifford, A., Randall, R., and VandenBrink, D. 2018. Dispatch Optimization in Bulk Tanker Transport Operations. *Interfaces* 48(5), 403-421.
- J11 **Sinha, A.K.** and Krishnamurthy, A. 2016. Dual Index Production and Subcontracting Policies for Assemble-to-Order Systems. *IIE Transactions*. 48(5) 415-427.
- J12 **Sinha, A.K.**, Davich, T., and Krishnamurthy, A. 2016. Optimisation of Production and Subcontracting Strategies. *International Journal of Production Research*. 54(8) 2377-2393.
- J13 **Sinha, A. K.**, and Tiwari, M. K. (2012). Co-evolutionary Immuno-particle Swarm Optimization with Penetrated Hyper-mutation for Distributed Inventory Replenishment. *Engineering Applications of Artificial Intelligence*, 25(8) 1628-1643.
- J14 **Sinha, A. K.**, Aditya, H. K., Tiwari, M. K., and Chan, F. T. (2011). Agent Oriented Petroleum Supply Chain Coordination: Co-evolutionary Particle Swarm Optimization Based Approach. *Expert Systems with Applications*, 38(5) 6132-6145.

#### Submitted papers:

- J15 **Sinha, A.K.** and Maity, M. 2024. Exact Graph Decomposition Approach for Bulk Dispatch Decisions with Generalized Compatibility Constraints. Submitted to *Transportation Research: Part B*
- J16 Toloioe, A. and **Sinha, A.K.** 2024. Optimal battery and drone management in last-mile logistics under uncertainty: A novel decomposition-based approach. Submitted to *Transportation Research: Part E*.
- J17 Maleki, M. and **Sinha, A.K.** 2023. A Multi-Period Resource Management Model for Intermodal Terminals: An Improved Mathematical Model. Submitted to *IEEE Transactions on Systems, Man, Cybernetics: Systems*.
- J18 Toloioe, A., Wu, H., Palani, A., **Sinha, A.K.**, and Liu, X. 2022. A Multi-Cut L-Shaped Decomposition Algorithm for Stochastic Security Constrained Unit Commitment with Renewable Generation. Submitted to *International Journal of Electrical Power and Energy Systems*.

#### Working Papers:

- J19 Toloioe, A. , Heier-Stamm, J., **Sinha, A.K.**, Chang, S. 2022. A two-stage stochastic mixed-integer program for inventory and distribution of humanitarian aid under uncertainty.
- J20 Kappelman, A. and **Sinha, A.K.** 2022. Reinforcement learning for blending problem in food supply chain.
- J21 Maity, M. and **Sinha, A.K.** 2022. Prognosis and diagnosis of bacteria contamination in food supply chain.
- J22 Maleki, M. and **Sinha, A.K.** 2022. Optimal route in relay network with driver time-at-home constraints.

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#### REFEREED CONFERENCE PROCEEDINGS

- C1 Maity, M., **Sinha, A. K.**, and Chang, S. (2022, June) Q-Learning Approach to Mitigate Bacterial Contamination in Food Supply Chain. *ICDAPS Conference, Mumbai, India, 2022*.

- C2 Kappelman, A. and **Sinha, A. K.** (2019, May) Optimal Control in Dynamic Food Supply Chain under Quality Constraints. *IISE Annual Conference, Orlando, FL*, 2019.
- C3 Kappelman, A. and **Sinha, A. K.** (2019, May) Optimal Control in Dynamic Food Supply Chain under Quality Constraints. *IISE Annual Conference, Orlando, FL*, 2019.
- C4 Maity, M. and **Sinha, A. K.** (2019, May) Optimize Transparency and Traceability using Batch Dispersion and Blockchain Technology. *IISE Annual Conference, Orlando, FL*, 2019.
- C5 **Sinha, A. K.**, and Krishnamurthy, A. (2015, May - June) Incorporating Risk of Competition in Sourcing Strategies for Assembled Products. *Industrial and Systems Engineering Research Conference (ISERC)*, 2015.
- C6 **Sinha, A. K.**, and Krishnamurthy, A. (2014, May - June) Optimal Control Policy for Multi-Product Assemble-to-Order Systems. *Industrial and Systems Engineering Research Conference (ISERC)*, 2014.
- C7 **Sinha, A. K.**, and Krishnamurthy, A. (2013, August). Production and Subcontracting Policies for Assemble-to-Order Systems with Service Level Constraints. *Automation Science and Engineering (CASE)*, 2013 IEEE International Conference on (pp. 570-575). IEEE.
- C8 **Sinha, A. K.**, and Krishnamurthy, A. (2013, May). Production and Subcontracting Policies for Assemble-to-Order Systems. *Industrial and Systems Engineering Research Conference (ISERC)*, 2013.
- C9 **Sinha, A. K.**, Aditya, H. K., Tiwari, M. K., & Chan, F. T. (2009, December). Multi-agent Based Petroleum Supply Chain Coordination: A Co-evolutionary Particle Swarm Optimization Approach. *Nature & Biologically Inspired Computing*, 2009. NaBIC 2009. World Congress on (pp. 1349-1354). IEEE.
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#### ORAL CONFERENCE PRESENTATIONS

- O1 Maity, M., **Sinha, A. K.**, and Chang, S. (2022, June) Q-Learning Approach to Mitigate Bacterial Contamination in Food Supply Chain. *ICDAPS Conference, Mumbai, India*, 2022.
- O2 Maity, M., **Sinha, A. K.**, and Chang, S. (2022, April) Prognosis, Diagnosis and Optimization in Food Supply Chain to Mitigate Bacterial Contamination. *CELDi Spring Symposium, Missouri*, 2022.
- O3 Toloioe, A., **Sinha, A. K.** (2022, May) Stochastic Models for Analysis and Optimization of Unmanned Aerial Vehicle Delivery on Last-mile Logistics. *IISE annual Conference, Seattle, WA*, 2022.
- O4 Maity, M., **Sinha, A. K.**, and Chang, S. (2022, May) Prognosis, Diagnosis and Optimization in Food Supply Chain to Mitigate Bacterial Contamination. *IISE annual Conference, Seattle, WA*, 2022.
- O5 Toloioe, A., **Sinha, A. K.** (2022, May) A two-stage stochastic mixed-integer program for reliable supply chain network design under uncertain disruptions and demand. *INFORMS Annual Conference, Anaheim, CA*, 2021.
- O6 Toloioe, A. and **Sinha, A. K.** (2021, April) A two-stage stochastic mixed-integer program for reliable supply chain network design under uncertain disruptions and demand. *CELDi Spring Symposium, Arkansas*, 2021.
- O7 Maity, M., Toloioe, A. and **Sinha, A. K.** (2020, April) General Repositioning Strategy for Empty Containers. *CELDi Spring Symposium, Missouri*, 2020.
- O8 Kappelman, A. and **Sinha, A. K.** (2019, Oct) Optimal Control in Food Supply Chain Using Big Data. *INFORMS Annual Conference, Seattle, WA*, 2019.
- O9 Maity, M. and **Sinha, A. K.** (2019, Oct) Stochastic Model For Optimizing Transparency and Traceability in Food Supply Chain. *INFORMS Annual Conference, Seattle, WA*, 2019.
- O10 Toloioe, A. and **Sinha, A. K.** (2019, Oct) Managing Drones and Battery Inventories On Last-mile Logistics Under Uncertainty. *INFORMS Annual Conference, Seattle, WA*, 2019.
- O11 Kappelman, A. and **Sinha, A. K.** (2019, May) Optimal Control in Dynamic Food Supply Chain under Quality Constraints. *IISE Annual Conference, Orlando, FL*, 2019.

- O12 Maity, M. and **Sinha, A. K.** (2019, May) Optimize Transparency and Traceability using Batch Dispersion and Blockchain Technology. *IISE Annual Conference, Orlando, FL*, 2019.
- O13 Toloioe, A. and **Sinha, A. K.** (2019, May) Modelling and design of Reliable Supply Chain Network under Facility Disruption Risks. *IISE Annual Conference, Orlando, FL*, 2019.
- O14 **Sinha, A. K.** (2018, April) Rich Trailer Routing Optimization For Chemicals and Liquid Bulk. *CELDi Spring Symposium, Virginia Tech, Blacksburg, VA*, 2018.
- O15 **Sinha, A. K.** and Delli, U. (2018, May) Rich Trailer Routing Optimization For Chemicals and Liquid Bulk. *IISE Annual Conference, Orlando, FL*, 2018.
- O16 **Sinha, A. K.** (2017, Oct) Rich Trailer Routing Optimization For Chemicals and Liquid Bulk. *INFOMRS Annual Conference, Houston, TX*, 2017.
- O17 **Sinha, A. K.** , and Krishnamurthy, A. (2016, Nov) Stochastic Models for Strategic Sourcing in the Energy Industry. *INFOMRS Annual Conference, Nashville, TN*, 2016.
- O18 **Sinha, A. K.** , and Krishnamurthy, A. (2016, May) Stochastic Models for Strategic Sourcing in the Energy Industry. *Industrial and Systems Engineering Research Conference (ISERC), Anaheim, CA*, 2016.
- O19 **Sinha, A. K.** , and Krishnamurthy, A. (2016, May) Stochastic Models for Strategic Sourcing in the Energy Industry. *Productions and Operations Management Society (POMS), Anaheim, CA*, 2016.
- O20 **Sinha, A. K.**, and Krishnamurthy, A. (2015, Nov) Strategic Sourcing for Assembled Products. *INFOMRS Annual Conference, Philadelphia, PA*, 2015.
- O21 **Sinha, A. K.**, and Krishnamurthy, A. (2015, May - June) Incorporating Risk of Competition in Sourcing Strategies for Assembled Products. *Industrial and Systems Engineering Research Conference (ISERC), Nashville, TN*, 2015.
- O22 **Sinha, A. K.**, and Krishnamurthy, A. (2014, Nov) Competition Risk in Sourcing Strategies for Assembled Products. *INFOMRS Annual Conference, San Francisco, CA*, 2014.
- O23 **Sinha, A. K.**, and Krishnamurthy, A. (2014, May - June) Optimal Control Policy for Multi-Product Assemble-to-Order Systems. *Industrial and Systems Engineering Research Conference (ISERC), Montreal, QC, Canada*, 2014.
- O24 **Sinha, A. K.**, and Krishnamurthy, A. (2013, Nov) Optimal Production and Subcontracting Policies in Assemble-to-Order Systems. *INFOMRS Annual Conference, Minneapolis, MN*, 2013.
- O25 **Sinha, A. K.**, and Krishnamurthy, A. (2013, Aug). Production and Subcontracting Policies for Assemble-to-Order Systems with Service Level Constraints. *Automation Science and Engineering (CASE), Madison, WI*, 2013 IEEE International Conference.
- O26 **Sinha, A. K.**, and Krishnamurthy, A. (2013, May). Production and Subcontracting Policies for Assemble-to-Order Systems. *Industrial and Systems Engineering Research Conference (ISERC), San Juan, Puerto Rico*, 2013.

## RESEARCH GRANTS

**Funded/Recommended Research Grants (Total: \$1,298,965.08, My share: \$547,043.75):**

- 1 Data driven decomposition based approach for resilient supply chain logistics, NSF, \$47,453. PI: **Sinha, A.K.**
- 2 Collaborative Research: AMPS: Deep-Learning-Enabled Distributed Optimization Algorithms for Stochastic Security Constrained Unit Commitment, NSF, AMPS-Algorithms for Modern Power Systems, \$500,000.00, PI: Wu, H., CO-PI: **Sinha, A.K.**, and Wu, W., Duration: 09/01/2022 - 08/31/2025. **Status: Recommended for Funding.** My Share: \$166,666.67.

- 3 Mitigating the Potential Risk of E. coli and Salmonella Contamination in Wheat Supply Chain Using Big Data Strategies, USDA, \$454,987.00, PI: Siliveru, K., CO-PI: **Sinha, A.K.**, Chang, S., Phebus, R., Bhadriraju, S., Li, Y. and Aldrich, G., Duration:1/1/2021 - 12/31/2023. May Share: \$36,399.
  - 4 Schneider Enterprise Resources, LLC, \$138,000.00, Development of New Engineering Models, PI: **Sinha, A.K.**, Expires: June 2020.
  - 5 Schneider Enterprise Resources, LLC, \$158,525.08, Dispatch Strategies in Intermodal Transportation: A Feasibility and Validation Study, PI: **Sinha, A.K.**, Expires: May 2019.
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## INDUSTRY PROJECTS

### *Supply Chain/Sourcing Projects*

1. **National Oilwell Varco**, Orange, CA, USA, 2014-2015  
Develop efficient machine utilization and machine load balancing decision tool.  
Develop MINLP and queuing formulation for serial production lines to determine in-sourcing decisions.  
Develop efficient simulation models to analyze engineering processes and optimal staffing levels.
2. **National Oilwell Varco**, Edmonton, AB, Canada, 2013-2014  
Develop optimization and simulation models to optimize sourcing decisions for complex assembly lines.
3. **National Oilwell Varco**, Houston, TX, USA, 2012-2013  
Develop optimization and queuing models for serial production lines to determine outsourcing decisions.
4. **National Oilwell Varco**, Houston, TX, USA, 2012.  
Develop methodologies to derive solutions to improve part availability to assembly operations.

### *Supply Chain Management Projects*

5. **Procter & Gamble Ltd.**, Mumbai, Maharashtra, India, 2010  
Vehicle routing and allocation of products in the transportation system.

### *Manufacturing Projects*

6. **KSM Industries**, Germantown, WI, USA, 2015  
Derive strategies to reduce lead time for key fabricated products.
7. **Western State Envelope and Label**, Buttlar, WI, USA, 2015  
Implement cells in high mix high volume manufacturing environment.
8. **John Deere**, Horicon, WI, USA, 2015  
Design of assembly line for snow products to reduce labor cost and increase throughput.
9. **Cottrell Inc.**, Gainesville, GA, USA, 2015  
Redesign cells to consolidate manufacturing, fabrication, and assembly operations to reduce lead time.
10. **John Deere**, Horicon, WI, USA, 2012-2013  
Redesign fabrication operation and material handling systems to reduce lead time.
11. **Phoenix Products**, Milwaukee, WI, USA, 2012  
Implement cells to reduce lead times and material handling for fabrication operations.
12. **Rapid Line, Grand Rapids**, MI, USA, 2012  
Redesign manufacturing cells to reduce lead times in high mix low volume manufacturing environment.

### *Internship*

13. **Warwick Manufacturing Group**, Warwick University, Coventry, United Kingdom, 2010.  
Develop a virtual reality model make the medical practitioner adept in prostate cancer palpation.
14. **ONGC Ltd.**, Hazira plant, Gujarat, India, 2009.  
Assessment of workforce at Quality & Process Control Laboratory.

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## TEACHING EXPERIENCE

### **GSCM 450: Supply Chain Quality Management (Spring 2024, Fall 2024)**

Instructor, West Virginia University.

### **GSCM 360: Supply Chain Analytics (Fall 2023, Spring 2024)**

Instructor, West Virginia University.

### **IMSE 811: Advanced Production and Inventory Control (Spring 2019)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 866: Applied Stochastic Processes and Theoretical Simulation (Fall 2018, 2020, 2022)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 867: Stochastic Programming (Fall 2019, 2021)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 892: Graduate Seminar (Spring 2018)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 633: Production Planning and Inventory Control (Fall 2022)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 660: Operations Research II (Spring 2020)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 680: Quantitative Problem Solving Techniques (Summer 2022, Fall 2022)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 685: Manufacturing Information Systems (Fall 2020, Spring 2021)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **IMSE 643: Industrial Simulation (Fall 2017, Spring 2018, 2020, 2022)**

Instructor, Industrial and Manufacturing Systems Engineering, Kansas State University.

### **ISyE 641: Design and Analysis of Manufacturing Systems (Spring 2015, 2016)**

Teaching Assistant, Industrial and Systems Engineering, University of Wisconsin-Madison.

Rating: 4.77/5.00.

### **Executive Education (2012 - 2015)**

Conducted education sessions on manufacturing lead time mapping tool (50+ executives).

Organized multiple case studies on manufacturing and supply chain processes (50+ executives).

Conducted simulation games to identify opportunities in manufacturing shop-floor (30+ executives).

### **Mentorship (2012-2015)**

Co-supervised more than 10 projects by graduate students at the QRM Center (over 30 students).

Co-supervised 3 industry theses by graduate students at the QRM Center.

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## ACADEMIC HONORS

1. Pritsker Doctoral Dissertation Award, First Prize from Institute of Industrial and Systems Engineers 2018.
2. Finalist for Daniel H. Wagner Prize 2017 for Excellence in Operations Research Practice.
3. Worked on award winning Industry-University collaboration (I5 Award, IISE 2016).
4. Fein, Richard S and Harriet K scholarship award (2015-2016).
5. Vinod K. and J. Gail Sahney scholarship award (2013-2014).
6. Material Handling Education Foundation Inc. (MHEFI) scholarship award (2012-2013).
7. Quick Response Manufacturing (QRM) level I certificate.
8. Best B.Tech project award (2011).

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## MEMBERSHIP AND SERVICE

1. Site Director at CELDi at Kansas State University, 2021-2023.
  2. IMSE representative on the Academic Advising Committee, 2021-present.
  3. Undergraduate committee member at Industrial and Manufacturing Systems Engineering Department, 2018-2019.
  4. Member of INFORMS (2013-2018), IIE (2013-2018), IEEE (2013), MSOM, TSL.
  5. Session chair for *Risk and Uncertainty Modeling* session at ISERC 2015.
  6. Session chair for *Supply Chain and Logistics* session at ISERC 2016.
  7. Reviewer for *IIE Transaction*, *International Journal of Production Research* journal, *International Journal of Production Economics*, *International Journal of Information Management*, *ISERC (now known as IISE) conference proceedings*, *Sustainability journal*, *MDPI*.
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## COMPUTER SKILLS

Programming: Matlab (Expert), Java (Expert), C/C++ (Proficient), Python (Proficient), SQL (Proficient).

Statistics and Optimization: R (Expert), Minitab (Expert), SPSS (Proficient).

Optimization: GAMS (Expert), CPLEX ILOG (Expert), AIMMS (Proficient).

Microsoft Office experience: Access, Word, Excel, PowerPoint, Visio.