


# Ashkan Negahban

Associate Professor of Engineering Management  
The Pennsylvania State University  
School of Graduate Professional Studies

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## EDUCATION

**Auburn University**; Auburn, AL, USA

*Ph.D. in Industrial and Systems Engineering*; August 2016

*Advisor*: Dr. Jeffrey S. Smith

*Dissertation*: Application of simulation and optimization approaches in supply-constrained innovation diffusion

**Auburn University**; Auburn, AL, USA

*M.E. in Industrial and Systems Engineering*; May 2012

## RESEARCH INTERESTS

Stochastic simulation techniques (agent-based, discrete-event, and Monte Carlo), statistical data analysis, and optimization methods for analyzing complex systems. Research interests also include simulation-based learning environments in STEM education.

## EMPLOYMENT HISTORY

**Penn State University, School of Graduate Professional Studies**, 2022 – present

Associate Professor of Engineering Management

**Penn State University, School of Graduate Professional Studies**, 2016 – 2022

Assistant Professor of Engineering Management

**Auburn University**, 2013 – 2016

Instructor, Department of Industrial and Systems Engineering

**Auburn University** – 2011 – 2016

Research and Teaching Assistant, Department of Industrial and Systems Engineering.

## GRANTS AND SPONSORED RESEARCH (Total funding: \$1.1M)

1. **A. Negahban (PI)**, O. Ashour, S. Ozden. "Overcoming Critical Skill Gaps in Residential and Online STEM Education via Novel Immersive, Industry-aligned Simulated Environments," National Science Foundation. June 2020 – May 2023, \$831,276.
2. R. Sangwan, S. M. Srinivasan, **A. Negahban (co-PI)**. "Predicting the Level and Impact of Social Distancing Compliance," Microsoft AI for Health Program, July 2020 – January 2021, \$30,000.

3. **A. Negahban (PI)**, O. Onipede, S. Ozden, O. Ashour, C. Millet. “Transforming Online and On-Campus Education through Simulated Real-World Inspired Industry Projects,” University Strategic Initiative Seed Grants, The Pennsylvania State University. January 2019 – December 2020, \$59,348.
4. **A. Negahban (PI)**. “Optimizing COVID-19 Testing and Control Strategies in Communities and Public Transportation,” Google COVID-19 Research Grants, July 2020 – November 2020, \$9,000.
5. **A. Negahban (PI)**, O. N. Bjornstad, M. Darayi, G. Qiu. “Optimizing COVID-19 Control Strategies in Public Transportation Enabled by Individual-Level Data Analytics and Simulations,” The Institute for Computational and Data Sciences, The Pennsylvania State University, April 2020 – October 2020, \$15,105.
6. S. M. Srinivasan, R. Sangwan, **A. Negahban (co-PI)**. "Impact of Social Distancing Measures on Social, Economic, and Emotional Well-Being When Managing Response to Pandemics," Funded jointly by the Social Science Research Institute, the Institute for Computational and Data Sciences, and the Huck Institutes of the Life Sciences, The Pennsylvania State University, April 2020 – October 2020, \$33,778.
7. **A. Negahban (PI)**. “Virtual Reality-Enabled Simulation Modules for Teaching and Learning of Modeling Concepts,” Teaching & Learning Innovation Grant, The Pennsylvania State University, February 2019 – December 2020, \$8,200.
8. M. Darayi, **A. Negahban (co-PI)**, Q. Qiang, S. M. Srinivasan. “Leveraging Big Data for Holistic Analysis of PA's Freight Transportation Infrastructure Resilience Subject to Natural and Man-Made Disasters” The Center for Security Research and Education. January 2019 – December 2019, \$71,437.
9. **A. Negahban (PI)**, G. Qiu, M. Stutman, S. W. Wagner. “Energy Efficient Buildings: Using Data Analytics to Incorporate Occupancy in Scheduling and Load Profiling,” Institutes for Energy and the Environment, The Pennsylvania State University. April 2018 – June 2019, \$33,050.

## JOURNAL PUBLICATIONS

1. **A. Negahban**, 2021. “Estimating the True Arrival, Balking, and Reneging Processes from Censored Transactional Data: A Simulation-Based Approach,” *SIMULATION*, doi: [10.1177/00375497211061115](https://doi.org/10.1177/00375497211061115)
2. **A. Negahban**, P. Giabbanelli, 2021. “Hybrid Agent-Based Simulation of Adoption Behavior and Social Interactions: Alternatives, Opportunities, and Pitfalls,” *IEEE Transactions on Computational Social Systems*, Vol. 9(3), p 770-780.
3. R.S. Sangwan, **A. Negahban**, R.L. Nord, I. Ozkaya, 2021. “Optimization of Software Release Planning Considering Architectural Dependencies, Cost, and Value,” *IEEE Transactions on Software Engineering*, Vol. 48(4), p 1369-1384.

4. A. Gupta, Y. Badr, **A. Negahban**, R.G. Qiu, 2021. "Energy-Efficient Heating Control for Smart Buildings with Deep Reinforcement Learning," *Journal of Building Engineering*, Vol. 34, p 101739.
5. A. Pallikere, G. Qiu, P. Delgoshaei, **A. Negahban**, 2020. "Incorporating Occupancy Data in Scheduling Building Equipment: A Simulation Optimization Framework," *Energy and Buildings*, Vol. 209, p 109655.
6. **A. Negahban**, 2019. "Simulation-Based Estimation of the Real Demand in Bike-Sharing Systems in the Presence of Censoring," *European Journal of Operational Research*, Vol. 277(1), p 317-332.
7. M.A.A. Yazdi, **A. Negahban**, L. Cavuoto, F.M. Megahed, 2019. "Optimization of Split Keyboard Design for Touchscreen Devices," *International Journal of Human-Computer Interaction*, Vol. 35(6), p 468-477.
8. W. Hellmann, D. Marino, M. Megahed, M. Suggs, J. Borowski, **A. Negahban**, 2019. "Human, AGV or AIV? An Integrated Framework for Material Handling System Selection with Real-World Application in an Injection Molding Facility," *The International Journal of Advanced Manufacturing Technology*, Vol. 101, p 815-824.
9. **A. Negahban**, J.S. Smith, 2018. "Optimal Production-Sales Policies and Entry Time for Successive Generations of New Products," *International Journal of Production Economics*, Vol. 199, p 220-232.
10. **A. Negahban**, M. Dehghanimohammadabadi, 2018. "Optimizing the Supply Chain Configuration and Production-Sales Policies for New Products over Multiple Planning Horizons," *International Journal of Production Economics*, Vol. 196, p 150-162.
11. **A. Negahban**, 2018. "Optimizing Consistency Improvement of Positive Reciprocal Matrices with Implications for Monte Carlo Analytic Hierarchy Process," *Computers & Industrial Engineering*, Vol. 124, p 113-124.
12. **A. Negahban**, J.S. Smith, 2018. "A Joint Analysis of Production and Seeding Strategies for New Products: An Agent-Based Simulation Approach," *Annals of Operations Research*, Vol. 268(1-2), p 41-62.
13. **A. Negahban**, J.S. Smith, 2016. "The Effect of Supply and Demand Uncertainties on the Optimal Production and Sales Plans for New Products," *International Journal of Production Research*, Vol. 54(13), p 3852-3869.
14. **A. Negahban**, J.S. Smith, 2014. "Simulation for Manufacturing System Design and Operation: A Comprehensive Survey," *Journal of Manufacturing Systems*, Vol. 33(2), p 241-261.
15. **A. Negahban**, L. Yilmaz, T. Nall, 2014. "Managing Production Level in New Product Diffusion: An Agent-Based Simulation Approach," *International Journal of Production Research*, Vol. 52(17), p 4950-4966.
16. **A. Negahban**, L. Yilmaz, 2014. "Agent-Based Simulation Applications in Marketing Research: An Integrated Review," *Journal of Simulation*, Vol. 8, p 129-142.

17. S.M. Asadzadeh, A. Azadeh, **A. Negahban**, A. Sotoudeh, 2013. "Assessment and Improvement of Integrated HSE and Macro-Ergonomics Factors by Fuzzy Cognitive Maps: The Case of a Large Gas Refinery," *Journal of Loss Prevention in the Process Industries*, Vol. 26(6), p 1015-1026.
18. A. Azadeh, **A. Negahban**, M. Moghaddam, 2012. "A Hybrid Computer Simulation-Artificial Neural Network Algorithm for Optimization of Dispatching Rule Selection in Stochastic Job Shop Scheduling Problems," *International Journal of Production Research*, Vol. 50(2), p 551-566.
19. A. Azadeh, M. Moghaddam, S.M. Asadzadeh, **A. Negahban**, 2011. "An Integrated Fuzzy Simulation-Fuzzy Data Envelopment Analysis Algorithm for Job-Shop Layout Optimization: The Case of Injection Process with Ambiguous Data," *European Journal of Operational Research*, Vol. 214(3), p 768-779.
20. A. Azadeh, M. Sheikhalishahi, M. Tabesh, **A. Negahban**, 2011. "The Effects of Pre-processing Methods on Forecasting Improvement of Artificial Neural Networks," *Australian Journal of Basic and Applied Sciences*, Vol. 5(6), p 570-580.

## REFEREED CONFERENCE PROCEEDINGS

1. M. Nowparvar, O. Ashour, S.G. Ozden, D. Knight, P. Delgoshaei, **A. Negahban**. "An Assessment of Simulation-Based Learning Modules in an Undergraduate Engineering Economy Course," In *Proceedings of the 2022 ASEE Annual Conference and Exposition*, Minneapolis, MN, June 2022.
2. M. Nowparvar, X. Chen, O. Ashour, S.G. Ozden, **A. Negahban**. "Combining Immersive Technologies and Problem-Based Learning in Engineering Education: Bibliometric Analysis and Literature Review," In *Proceedings of the 2021 ASEE Annual Conference and Exposition*. Virtual Conference due to COVID-19, July 2021.
3. P. Giabbanelli, J. Badham, B. Castellani, H. Kavak, V. Mago, **A. Negahban**, S. Swarup. "Opportunities and Challenges in Developing Covid-19 Simulation Models: Lessons from Six Funded Projects," In *Proceedings of the 2021 Annual Modeling and Simulation Conference*. Virtual Conference due to COVID-19, June 2021.
4. A. Ahire, **A. Negahban**. "A Data Analysis Method for Estimating Balking Behavior in Bike-Sharing Systems," In *Proceedings of the INFORMS International Conference on Service Science*, Virtual Conference due to COVID-19, December 2020.
5. S. Ozden, O. Ashour, **A. Negahban**. "Novel Immersive Simulation-Based Learning Modules for Teaching Fundamental Database Concepts," In *Proceedings of the 2020 ASEE Annual Conference and Exposition*. Virtual Conference due to COVID-19, June 2020.
6. S. Patel, G. Qiu, **A. Negahban**. "Incentive-Based Rebalancing of Bike-Sharing Systems," In *Proceedings of the INFORMS International Conference on Service Science*, Phoenix, AZ, November 2018.

7. **A. Negahban.** “Neural Networks and Agent-Based Diffusion Models,” In *Proceedings of the 2017 Winter Simulation Conference*, Las Vegas, NV, December 2017.
8. **A. Negahban, M. Ansari, J.S. Smith.** “ADD-MORE: Automated Dynamic Display of Measures of Risk and Error,” In *Proceedings of the 2016 Winter Simulation Conference*, Washington, DC, December 2016.
9. **M. Ansari, A. Negahban, F.M. Megahed, J.S. Smith.** “HistoRIA: A New Tool for Simulation Input Analysis,” In *Proceedings of the 2014 Winter Simulation Conference*, Savannah, GA, December 2014.
10. **A. Negahban, J.S. Smith.** “Production-Sales Policies for New Product Diffusion under Stochastic Supply,” In *Proceedings of the Sixth International Conference on Advances in System Simulation (SIMUL)*, Nice, France, October 2014.
11. **A. Negahban.** “A Hybrid Simulation Framework for the Newsvendor Problem with Advertising and Viral Marketing,” In *Proceedings of the 2013 Winter Simulation Conference*, Washington, DC, December 2013.
12. **A. Negahban, I. Uludag, Y. Yang.** “An Integer Programming Approach to Optimize Typing Methods on Smartphones,” In *Proceedings of the 2013 IIE Annual Conference and Expo*, San Juan, Puerto Rico, May 2013.

## OTHER CONFERENCE PRESENTATIONS

1. **A. Negahban, C. Speir.** “A Customizable Agent-based Simulation Tool for Analyzing Infectious Disease Control Strategies in Metropolitan Areas,” *INFORMS Annual Meeting*, Anaheim, CA, October 2021.
2. **C. Speir, A. Negahban.** “Analyzing Covid-19 Control Strategies in Metropolitan Areas: A Customizable Agent-Based Simulation Tool,” *Winter Simulation Conference (special track on Covid-19)*, Virtual Conference due to Covid-19, December 2020.
3. **A. Negahban.** “Overcoming Critical Skill Gaps in Residential and Online STEM Education via Novel Immersive, Industry-aligned Simulated Environments,” *Annual NSF ECR PI Meeting*, Virtual Conference due to Covid-19, November 2020.
4. **C. Speir, V. Sivaram, M. Darayi, G. Qiu, O. Bjornstad, A. Negahban.** “Developing and Evaluating an Integrated Mobility and Epidemic Vulnerability Index via Network and Simulation Analysis,” *INFORMS Annual Meeting*, Virtual Conference due to Covid-19, November 2020.
5. **A. Negahban** (panelist). Panel session on “Extended Reality- and Simulation-Based STEM Education,” *IIE Annual Conference and Expo*, Virtual Conference due to Covid-19, October 2020.
6. **A. Negahban.** “Simulation-Based Queueing Inference of the True Arrival, Balking, and Reneging Processes from Censored Transactional Data,” *INFORMS Annual Meeting*, Seattle, WA, October 2019.
7. **A. Negahban, J.S. Smith.** “SimulationAndSimio.org: An Online Course in Discrete-

- Event Simulation,” *IISE Annual Conference and Expo*, Orlando, FL, May 2019.
8. **A. Negahban**. “Estimating the Real Demand in Bike-Sharing Systems,” *INFORMS Annual Meeting*, Phoenix, AZ, November 2018.
  9. **A. Negahban**, G. Qiu, M. Stutman, S. W. Wagner. “Data Analytics and Agent-Based Simulation for Energy Efficient Buildings,” *PI World Conference*. San Francisco, CA, April 2018.
  10. **A. Negahban**, G. Qiu, S. Patel. "An Incentive-Based Rebalancing Scheme for Large Bike-Sharing Systems," *INFORMS Annual Meeting*, Houston, TX, October 2017.
  11. **A. Negahban**, J.S. Smith. “Agent-Based Simulation of Production and Seeding Strategies for Innovations,” *INFORMS Annual Meeting*, Nashville, TN, November 2016.
  12. **A. Negahban**, J.S. Smith. “Responding to Forecasting Errors for New Products: An Agent-Based Simulation Approach,” *INFORMS Annual Meeting*, Philadelphia, PA, November 2015.
  13. **A. Negahban**, J.S. Smith. “Forecasting the Demand for New Products: An Agent-Based Simulation Model,” *Annual Meeting of the Decision Sciences Institute (DSI)*, Seattle, WA, November 2015.
  14. **A. Negahban**, J.S. Smith. “Optimal Production and Sales Plan for New Products under Supply Uncertainty,” *Annual Meeting of the Decision Sciences Institute (DSI)*, Tampa, FL, November 2014.
  15. **A. Negahban**, J.S. Smith. “Production and Sales Management for Successive Generations of New Products under Supply Constraints,” *INFORMS Annual Meeting*, San Francisco, CA, November 2014.
  16. **A. Negahban**, L. Yilmaz. “NK Fitness Landscapes to Optimize Genetic Algorithms for Flexible Manufacturing System Scheduling,” *INFORMS Annual Meeting*, Minneapolis, MN, October 2013.
  17. A. Azadeh, M Sheikhalishahi, **A. Negahban**, R. Beikverdi. “Improving the Kruskal-Wallis Experiments with Fuzzy and Linguistic Variables: Case Studies with Uncertainty and Noise,” *The 2<sup>nd</sup> World Conference on Educational Technology Researches*, Nicosia, Cyprus, June 2012.

## TEACHING EXPERIENCE

**Assistant Professor** – Penn State Great Valley, School of Graduate Professional Studies

- SYSEN 532 – *Simulation in Systems Engineering: Discrete-Time Systems* (new course development)
- SYSEN 536 – *Decision Making and Risk Analysis*
- ENGMT 501 – *Engineering Management Science*
- ENGMT 539 – *Engineering Management Strategy*
- ENGMT 510 – *Economics and Financial Studies for Engineers*

Total of 30 course offerings, average student rating: 6.15 / 7.00

**Instructor** – Auburn University

- INSY 3420 – *Simulation*
- STAT 3600 – *Probability and Statistics*

### **Video-based E-learning Modules and Short Courses**

- *E-Learning Modules for Discrete Event Simulation with Simio*
  - Co-developed, with Dr. Jeffrey Smith, a series of videos and curricula for learning discrete event simulation with Simio as part of a funded project from Simio, LLC. The course is available at <http://simulationandsimio.org>
- *Simulation Video Lab Series*
  - Designed and developed an 8-part video-based laboratory series for learning discrete event simulation with Simio. The complete lab series is available on Ashkan Negahban's [website](#) and also on his [YouTube Channel](#). As of June 2021, the lab series has more than 225,000 views from 160+ countries.
- *2-Day Short Course on Simulation Modeling and Analysis*, Auburn University, Summer 2014.

**Teaching Assistant:** Auburn University

- *INSY 7400: Simulation Modeling and Analysis*, Fall 2013 – 2014.
- *INSY 3420: Simulation*, Spring 2012 – 2014.
- *INSY 4700: Manufacturing Systems*, Fall 2011 – 2012.

## **MEMBERSHIPS**

Institute for Operations Research and the Management Sciences (INFORMS), since 2013  
INFORMS Simulation Society (I-Sim), since 2013  
INFORMS Junior Faculty International Group (JFIG), since 2017  
INFORMS Service Science Section, since 2017  
INFORMS Philadelphia Chapter, since 2017  
INFORMS Multiple-Criteria Decision-Making (MCDM) Section, since 2019  
ACM Special Interest Group on Simulation and Modeling (SIGSIM), since 2014

## **PROFESSIONAL SERVICE AND PEER-REVIEW ACTIVITIES**

### **Associate Editor**

SIMULATION: Transactions of the Society for Modeling and Simulation International, 2021 – present.

### **Peer-Review of Grant Proposals**

Maryland Industrial Partnerships Program (MIPS), 2022.  
National Science Foundation (NSF), Panelist, 2021.  
Institutes for Energy and the Environment (Penn State), Panelist, 2021.

### **Track Chair**

- INFORMS International Conference on Service Science, *Sharing Economy Modeling and Simulation Track*, 2020.
- Winter Simulation Conference, *Agent-Based Simulation Track*, 2017.

### **Council Member**

INFORMS Service Science Section, 2017 – 2019.

### **Program/Organizing Committee Member**

ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), 2020.

Winter Simulation Conference, *Modeling Methodology Track*, 2019 – present.

Winter Simulation Conference, *Agent-Based Simulation Track*, 2015 – present.

Winter Simulation Conference, *Simulation Education Track*, 2018.

INFORMS International Conference on Service Science, 2018.

### **Session Organizer/Chair**

ASEE Annual Conference and Exposition, 2020.

INFORMS International Conference on Service Science, 2020, 2018.

INFORMS Annual Meeting, 2017, 2015.

Winter Simulation Conference, 2019, 2017, 2014.

Annual Meeting of the Decision Sciences Institute, 2015.

### **Invited Reviewer**

#### Journals

- European Journal of Operational Research
- Transportation Research Part E: Logistics and Transportation Review
- International Journal of Production Research
- Journal of Manufacturing Systems
- ACM Transactions on Modeling and Computer Simulation
- Journal of Simulation
- Simulation Modeling Practice and Theory
- SIMULATION
- IISE Transactions
- Operations Research Perspectives
- Annals of Operations Research
- Journal of Business Research
- IEEE Computer
- IEEE Transactions on Engineering Management
- Production Planning & Control
- Applied Energy
- Economic Modelling
- Sustainable Cities and Society
- International Journal of Simulation and Process Modelling
- International Journal of Industrial and Systems Engineering

#### Conference proceedings

- Winter Simulation Conference, 2015 – present.
- ASEE Annual Conference, 2020 – present.
- ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), 2020.
- Annual Meeting of the Decision Sciences Institute (DSI), 2014, 2015.
- Institute of Industrial Engineers (IIE) Annual Conference, 2013.

### **University Service**

Chair, Faculty Affairs Committee, Penn State Great Valley, 2020 – present



Co-organizer, Student Poster Competition, Penn State Great Valley, 2017 – 2019  
Judge, DataFest Competition, Penn State University, 2017  
Member, Research Committee, Penn State Great Valley, 2018 – present  
Member, Faculty Affairs Committee, Penn State Great Valley, 2016 – 2020  
Member, Student Affairs Committee, Penn State Great Valley, 2017 – 2019  
Member, Systems Engineering Program Change Committee, 2017 – present  
Member, Engineering Management Program Change Committee, 2020 – present

## CERTIFICATES



The Data Scientist's Toolbox, Johns Hopkins University (on Coursera ), July 2015.

Preparing Future Faculty (PFF), Auburn University, May 2014.

Occupational Safety and Health 30-Hour Training Course in *General Industry Safety and Health*, OSHA, Auburn, Alabama; October 2010.

International Negotiation Skills Development Workshop; April 2007.

Quality Management System based on ISO 9000-2000 Standard Series Certificate, TÜV Academy, December 2006.

## INDUSTRY EXPERIENCE

**Aflac Distribution Center;** Columbus, GA, USA

*Professional Team Project, Aug – Dec 2010*

- Proposed new family-based SKU allocation and efficient order picking routes to eliminate worker congestion which doubled order picking rate

**Concrete Truck-Mixer Manufacturing Company**

*Industrial Engineer, Jan – Apr 2010*

- Proposed production plan which increased production rate by 30%
- Conducted time and motion study for concrete truck-mixer production line

**Steel-Structural Manufacturing Company, Intern, Summer 2009**

- Developed Project Quality Plan (PQP) based on ISO 10006 guideline

## HONORS AND AWARDS

- *Award for Excellence in Research and Scholarship*, The Pennsylvania State University, School of Graduate Professional Studies, August 2021.
- *VISTA Millennial Superstar Award*, Chester County, Pennsylvania, February 2020. The award recognizes Chester County's most dynamic professional leaders under the age of 40. This was the inaugural class of VISTA Millennial Superstars.
- *Early Career Award for Research and Scholarship*, The Pennsylvania State University, School of Graduate Professional Studies, August 2018.
- *Outstanding Doctoral Student*, Department of Industrial and Systems Engineering, Auburn University, 2013-2014 Academic Year.
- *ACM Special Interest Group on Simulation and Modeling (SIGSIM) Travel Award* to attend Winter Simulation Conference, Savannah, GA, December 2014 (\$1,000).