

Operations Research and Engineering Management
Seminar Series

Research Seminar
Reinforcement Learning for Optimizing Inventory of Beer
(and other things)



Dr. Larry Snyder

**Harvey E. Wagner Professor of Industrial and Systems Engineering and the
Deputy Provost for Faculty Affairs at Lehigh University**

**Friday, March 8th
11:00am - 12:15pm
Caruth 383**

Abstract: In this talk, I will discuss a deep reinforcement learning (DRL) agent that we developed to play the beer game, a popular classroom activity that demonstrates certain aspects of inventory management. Our DRL agent learns near-optimal performance when its computerized “teammates” act rationally, i.e., follow a base-stock policy. More interestingly, it outperforms the best-known policy when its teammates emulate (irrational) human players, suggesting that we might be able to learn from how the DRL agent plays the game. We demonstrate using a computerized beer game that we developed in collaboration with Opex Analytics (now Coupa).

Biography: Larry Snyder is the Harvey E. Wagner Professor of Industrial and Systems Engineering and the Deputy Provost for Faculty Affairs at Lehigh University in Bethlehem, PA. He received his Ph.D. in Industrial Engineering and Management Sciences from Northwestern University. Dr. Snyder’s research interests include modeling and solving problems in supply chain management and energy systems, particularly when the problem exhibits significant amounts of uncertainty. His research has been published in such journals as Manufacturing & Service Operations Management, Transportation Science, IEEE Transactions on Smart Grid, Naval Research Logistics, IISE Transactions, and Production and Operations Management. He is co-author of the textbook Fundamentals of Supply Chain Theory, published in 2011 by Wiley, which won the IIE/Joint Publishers Book-of-the-Year Award in 2012; a second edition was published in 2019. He is the author of Stockpyl, a Python package for inventory optimization and simulation, and he collaborated with Gurobi to develop the free educational software the Burrito Optimization Game. He also wrote two books of puzzles called The Opex Analytics Weekly Puzzle, volumes 1 and 2. He has served on the editorial boards of Transportation Science, IISE Transactions, OMEGA, and the Wiley Series on Operations Research and Management Science. He previously served as a Senior Research Fellow–Optimization for Opex Analytics. For more information, visit coral.ise.lehigh.edu/larry.