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

Dr. Larry Snyder
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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, IIEE 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,
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