INDUSTRIAL & SYSTEMS ENGINEERING SEMINAR

Wednesday, April 20
3:15 PM – Refreshments before the seminar
3:30 PM – Graduate Seminar
Mechanical Engineering Room 4125 A & B

On the Use of "Buy Up" as a Model of Customer Choice in Revenue Management

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In this talk we consider settings in which a revenue manager controls bookings over a sequence of flights. The revenue manager uses a buy-up model to select booking limits, and updates estimates of the model parameters as data are accumulated. The buy-up model we consider is based upon a simple model of customer choice, wherein each low-fare customer who is not able to purchase a low-fare ticket will, with a fixed probability, "buy up" to the high fare, independent of everything else. We analyze the evolution of the parameter estimates (of, e.g., the buy-up probability) and chosen booking limits in situations where the buy-up model is misspecified, that is, in situations where there is no setting of its parameters for which its objective function gives an accurate representation of expected revenue as a function of the booking limit. The analysis is motivated by the common situation in which a revenue manager does not know precisely how customers behave but nevertheless uses a parametric model to make decisions. Under some assumptions, we prove that the booking limits and parameter estimates converge and we compare the actual expected revenue at the limiting values with that associated with the booking limits that would be chosen if the revenue manager knew the actual behavior of customers. The analysis shows that the buy-up model often works reasonably well even when it is misspecified, and also reveals the importance of understanding how parameter estimates of misspecified models vary as functions of decisions

BIO: William L. Cooper is an Associate Professor in the Program in Industrial and Systems Engineering at University of Minnesota. He received a B.A. in Mathematics from the University of Pennsylvania in 1993 and a Ph.D. in Industrial Engineering from Georgia Tech in 1999. He currently serves as an Associate Editor for Operations Research and for Management Science and as a Senior Editor for Production and Operations Management. His research interests include stochastic modeling, revenue management, and inventory theory.

FOR MORE INFORMATION ON PROFESSOR COOPER'S RESEARCH, please visit:
http://www.isye.umn.edu/faculty/cooper.shtml