INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH

PRESENTS

IEOR MONDAY SEMINAR SERIES

SPRING 2008

March 17, 2008

3:30 to 4:30 P.M.

3108 ETCHEVERRY HALL

Dynamic Assortment Optimization with a Multinomial Logit Choice Model

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Abstract:

The paper considers a stylized model of a dynamic assortment optimization problem faced by a retailer. Given the limited store capacity, the retailer must decide which products to offer to customers to maximize the expected profit. We assume that each customer chooses the product that maximizes her utility and consider the multinomial logit choice model to represent demand. The retailer, however, does not know the demand for each product. She can learn the demand distribution
by offering different product assortments, observing resulting purchases, and inferring the demand distribution from past sales and assortment decisions. We present an adaptive algorithm for joint parameter estimation and assortment optimization. To evaluate our proposed policy, we define a benchmark profit as the maximum expected profit that the retailer can earn if she knows the demand distribution in advance. We show that the running average expected profit generated by our algorithm converges to the benchmark profit and establish its convergence rate. Numerical experiments based on sales data from an online retailer indicate that our policy performs well.

Joint work with Max Shen (UC Berkeley) and David Shmoys (Cornell)