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Provably Near Optimal Algorithms for Dynamic Assortment Problems

Abstract:

Assortment planning is a major operational issue that arises in many industries, such as retailing, airlines and consumer electronics. Given a set of products that are differentiated by price, quality and possibly other attributes, one has to decide on the subset of products and the respective quantities that will be stocked and offered to heterogeneous customers, who exhibit substitution behavior.

The general problem can be shown to be NP-hard to approximate better than a factor linear in the number of products. In this talk we discuss how for a range of practically interesting special cases, one could design conceptually simple policies that admit provably near-optimal solutions. The analysis reveals interesting structural properties, including hidden submodularity and decomposition properties.

The talk is based on several papers which are Joint work with Ali Aouad, Vineet Goyal and Danny Segev