

Revenue Management: Applications, Models and Algorithms

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Revenue management refers to the set of activities pursued by a firm to make the most beneficial use of limited inventories by selling the products to the right customer segment, at the right price and at the right time. Many industries, including air transportation, hospitality and retail, have benefited from application of revenue management models and algorithms. The common theme in these industries is that limited inventories are sold to customers from different segments that are willing to pay different prices. The problems are complicated by the fact that one often needs to capture the stochastic and dynamic nature of the demand and inventories are consumed in bundles, which, for example, is the case when customers purchase airline seats on multiple connecting flights or hotel rooms on consecutive nights. This talk reviews some of the essential stochastic models in revenue management and describes solution methodologies for them. Often times, these models result in dynamic programs with high-dimensional state variables. Some of the solution methods enable us to approximate the value functions in the dynamic programs, while others focus on a class of policies parameterized by a small set of parameters and use simulation optimization methods to find a good policy within this class.