DEMAND PREDICTION FOR TIME-EXPIRING INVENTORY

TECHNICAL FIELD

[0001] This application relates generally to the use of machine learning models and data analysis in the context of time-expiring inventory, and particularly to the assignment of training labels to machine learning sample data relating to time-expiring inventory.

BACKGROUND

[0002] In a typical transaction for a good or service, the manager that controls or owns the good sets the price of the good and waits for an interested party to agree to pay the proposed price. Oftentimes the manager fails to correctly price the good but because of incomplete information in the market and other economic factors someone may eventually agree to pay the price. However, pricing time-expiring inventories is a more challenging endeavor because if the inventory is not sold before it expires, the inventory is wasted and the manager receives no revenue. Thus, a manager of a time expiring inventory is susceptible to either pricing their inventory too high and risk losing revenue from expiration, or pricing their inventory too low and receiving suboptimal revenue but with good utilization. Additionally, the ideal or desired market-clearing price for a time-expiring inventory may change as the inventory approaches its expiration date. This combination of factors makes it difficult for a manager of a time-expiring inventory to optimally price their inventory.

Summary

[0002a] In an aspect, the present disclosure provides a computer-executed method comprising: receiving, at an online computing system, a first feature vector and a second feature vector for a subject listing, the subject listing comprising a time-expiring inventory available to be booked by one of a plurality of clients of the online computing system and managed by a manager, the first feature vector and the second feature vector each comprising a plurality of features of the listing including a price feature indicating a current price of the time-expiring inventory; inputting the first feature vector into a demand function to generate a demand estimate that is a numerical representation of a likelihood that the time-expiring inventory will receive a transaction request from one of the clients before the time-expiring inventory expires; inputting the second feature vector into a manager option function to generate an acceptance estimate that is a numerical representation of a likelihood that the manager of the time-expiring inventory is willing to offer the time expiring inventory to clients at the current price; and storing the demand estimate and the acceptance estimate.

[0003] An online system enables managers to create listings for time-expiring inventories and enables clients to submit a transaction request to reserve, lease, or buy a listed time-expiring inventory. The online system estimates demand for a listing of a time-expiring inventory and estimates the likelihood that a manager will price a listing over a range of prices. The online system defines a set of features that describe the time-expiring inventory, the associated listing, and the market for the time-expiring inventory. A set of these descriptive features is a feature vector for a listing. The online system estimates demand for a listing by inputting a feature vector of that listing into a demand function. The online system