

Public Abstract

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Department:Industrial Engineering

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Title:PRIORITIZATION OF HOSPITAL ORDERS CONSIDERING CANCELLATION PROBABILITIES

In a hospital laboratory premature cancellations of the test orders are driving up the laboratory running cost as they result in wasted resources and time. A test order that is cancelled during its processing results in waste of laboratory resources (labor, materials, etc.). We develop a queuing heuristic that prioritizes orders based on their cancellation probability and tardiness.

The cancellation probability is a function of order attributes (type of test, the doctor requested the test, urgency, etc.) and can be estimated from historical data. We compare the cost and timeliness of lab orders from our prioritization scheme against those from a First-Come-First-Served queuing system. Having no control over the nature of the tests ordering (arrival) and their cancellations (departure) we model them as random processes that follow certain probability distributions and include them into a Dynamic Programming model that attempts to minimize the expected total running cost by picking the "right" test to process at every decision epoch.