



**Engineering Management, Information, and Systems
Seminar Series**

Research Session

AI Optimization Framework for a Multi-Age Demographic Response



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This research develops two models: a Linear Scheduling Method (LSM) model and a dynamic pricing customer (DPC) model. The objective of these models is to minimize long-term costs and discomfort penalties of the LSM and DPC. Because preferences of these two agents are different, the models are inseparable and difficult to solve. Deterministic finite horizon linear programs are solved as an approximation of the stochastic models and computational experiments are provided. In addition, this study develops stochastic bounds under the two-agent framework in which the DPC operate independently of the LSM, but the LSM must react to the DPC actions. Experiments show that when the two agents both have perfect information, the LSM may have an inferior objective compared with the case of in which both agents follow a mean value problem policy. Nevertheless, there are bounds when the DPC follow the same set of actions.

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