

Industrial & Systems Engineering Seminar

Scheduling Impatient Customers in Queueing Systems Based on Time in Queue

Friday, February 3

10:15 AM - Refreshments, 10:30 AM - Graduate Seminar

Lind Hall Room 305



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Customer impatience has become an integral component of analyzing services, especially in the context of call centers. In such systems, arriving customers are typically assigned classes, where customers of the same class share similar features such as service needs. From the system's perspective, all customers arriving to the same class seem identical or homogeneous. However, as they wait in the queue, their residual willingness to wait changes. For instance, a customer who has already waited for 10 minutes may have a different residual willingness to wait as compared with a customer who has only waited for 1 minute. In this manner, as time progresses, customers of the same class become differentiated on their estimated patience levels. We exploit this dimension of customer heterogeneity to construct near-optimal scheduling policies in overloaded systems that dynamically prioritize customers based on their time in queue and their class. In a single-class system, where all arriving customers are homogeneous, our proposed policy has a simple structure and we find that implementing it can lead to significant improvements over the first come first serve policy. In a multi-class setting, we combine the single-class policy with a greedy class selection rule to obtain near-optimal performance.

This talk is based on joint work with Achal Bassamboo, Kellogg School of Management, in the following two papers:

1. *Scheduling Homogeneous Impatient Customers*, Forthcoming in Management Science,

Link: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2312643

2. *Scheduling Impatient Customers in Multi-class Parallel Queueing Networks Based on Time in Queue*, In preparation.

BIO:

Ramandeep S. Randhawa is an Associate Professor in the Department of Data Sciences and Operations at University of Southern California's Marshall School of Business. His research interests include designing service systems, revenue management, stochastic modeling, and mechanism and incentive design. His work has been published in journals that include Management Science, Manufacturing and Service Operations Management, and Operations Research. He currently serves on the editorial board of Management Science and Operations Research.