

# The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics  
and Operations Management

Seminar Announcement

## Patient Prioritization in Emergency Department Triage Systems: An Empirical Study of Canadian Triage and Acuity Scale (CTAS)

Dr. Eric Park  
Sauder School of Business  
University of British Columbia

**Date** : 9 December 2015 (Wednesday)  
**Time** : 11:00 - 12:15 pm  
**Venue** : Room 1005, LSK Business Building



**Abstract:** Emergency departments (EDs) typically use a triage system to classify patients into priority levels. However, most triage systems do not guide how exactly to route the patients within the assigned triage levels, hence, decision makers in the ED often use their own discretion to route patients. Also, how patient waiting is perceived in ED operations is not clearly understood. In this paper, we identify the ED patient waiting cost structure perceived by the ED patient routing decision maker from patient level ED visit data and derive policy implications and suggestions for improving triage systems.

We analyze the ED decision makers' patient routing behavior in four EDs in metro Vancouver, British Columbia area that use the Canadian Triage and Acuity Scale (CTAS) which has a waiting time-related target service level objective such as "95% of triage level 2 patients need to be seen by a physician within 15 minutes upon arrival". We propose a general discrete choice framework, consistent with the queueing literature, that can analyze prioritization behaviors in multi-class queues under mild assumptions. We find that the decision makers in all four EDs (1) have a perceived marginal patient waiting cost that is best fit by a piece-wise linear concave function in wait time; (2) generally follow first-come first-served (FCFS) principle within the same triage level but their adherence to FCFS decreases among patients who waited past a certain threshold; (3) apply a delay-dependent (dynamic) prioritization across different triage levels; (4) do not incorporate patient complexity information in prioritization decisions.

**Bio:** Eric Park is a postdoctoral research fellow in the Operations and Logistics Division at the Sauder School of Business of the University of British Columbia. He graduated from the Kellogg School of Management at Northwestern University with a PhD in Operations Management. His research interest is healthcare operations in the context of public health policies. He uses empirical methods to understand why certain policies are ineffective and/or associated with unintended outcomes. He studies both micro level (hands-on operational) and macro level (system-wide strategic) policies and provides an operational perspective to health policy designs. He has a MS and BS in mechanical engineering from the University of Michigan, Ann Arbor and Seoul National University respectively.