DEPARTMENT of INDUSTRIAL ENGINEERING
UNIVERSITY of HOUSTON

FRIDAY SEMINAR SERIES
BROADEN HORIZONS | EXTEND MINDS

Dr. Mehmet U. S. Ayvaci
Associate Professor
Naveen Jindal School of Management
The University of Texas at Dallas

Date: Friday, Oct 30, 2020
Time: 1 - 1:50 pm
Zoom Meeting ID: 970 7656 5407
Password: 477211

To Catch a Killer: A Data-Driven Personalized Sepsis Alert System, Accounting for Caregivers Compliance Behavior

Abstract: Sepsis affects more than 1.5 million people each year and contributes to as many as half of all hospital deaths in the US. Early detection and timely treatment are vitally important in sepsis care and can significantly reduce sepsis-related mortality. For timely identification, healthcare providers are increasingly leveraging automated electronic sepsis alerts. These alerts typically rely on sepsis identification guidelines designed for broad patient populations and do not take into account the behavior of the users of alerts, i.e., caregivers, and how they respond to the triggered alerts. In this talk, I will describe an alert system that we developed for early detection of sepsis. Our system personalizes alerts to individual patients and accounts for the compliance behavior of caregivers towards generated alerts. We formulate the problem of determining when to alert sepsis as an MDP and characterize threshold policies. Using clinical data from a hospital system that implemented an alert mechanism, we conduct counterfactual analysis. On average, our system detects 22% more sepsis cases and, if not at the same time as existing alerts, our alerts are 39 hours earlier on average.

Biography: Mehmet U. S. Ayvaci is an Associate Professor of Information Systems in the Jindal School of Management at the University of Texas Dallas. Dr. Ayvaci's research broadly addresses the grave inefficiencies in healthcare. He studies how to better utilize the available information and resources to improve quality outcomes while also reducing costs. He primarily focuses on improving decision making and understanding the role of information and information technology in supporting operations in healthcare organizations. In studying these problems, he uses stochastic modeling, game theory, econometric methods, data science, and statistics. Dr. Ayvaci's research is highly interdisciplinary; therefore, he collaborates with scholars from various fields and publish in premier journals both in management sciences and other disciplines such as medicine and informatics. His research efforts were recognized for excellence at academic outlets such as the Conference on Health Information Technology and Analytics (CHITA), INFORMS Decision Analysis Society, INFORMS Conference on Information Systems and Technology (CIST), and INFORMS eBusiness Section. His research efforts have received publicity through a variety of channels including coverage in media, news stories in practitioner magazines, and editorials of academic journals. Dr. Ayvaci received his B.S. degree in Industrial Engineering from Texas A&M University, his M.S. degree in Management Science & Engineering from Stanford University, and Ph.D. degree in Industrial and Systems Engineering from University of Wisconsin Madison.