

EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

Opportunities for Healthcare Operations Engineering & How First Come First Served Scheduling May be Replaced

ABSTRACT - This talk will have two components. First, I will provide an overview of some key research opportunities for industrial engineering (IE), operations research (OR), and operations engineering (OE) to advance care delivery and decision-making in healthcare. Second, I will describe a stream of research in my group that addresses the challenges of patient-centered care, consideration of patient urgency needs for a timely appointment, and how to model the care system for integrated and optimized patient flow.

In the first direction, I will describe some of the key issues shaping opportunities and barriers for research for improving healthcare delivery. These include precision medicine (personalization), patient experience and access, and coordination of care. I will discuss some ways in which healthcare research usually exhibits unique features that distinguish it from manufacturing and even other service system.

Second, we explain why first come first served (FCFS) scheduling cannot meet the need for improved care delivery, and methods being developed to replace or augment it. Healthcare is moving toward integrated care models in which a variety of services and specialties are coordinated to improve treatment and patient experiences. Improved timeliness of visits and the appropriateness of providers are two objectives that FCFS does not support well. This goal of appropriate access delays and coordinated care are difficult operational challenges. Our research addresses appointment scheduling and capacity planning for a network of heterogeneous patient types and service providers. We emphasize how to approximately optimize the system to provided limits by patient urgency on the wait to begin treatment. We develop models of stochastic care pathways (sequences of visits) to facilitate the timely coordination of care and increase personalization. Our data-driven healthcare OE methodologies have grown out of practice-based collaborations with several health systems.



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SPEAKER BIO - Mark Van Oyen is a Professor of Industrial and Operations Engr. (IOE) at the University of Michigan. His interests include the analysis, design, prediction and control of stochastic systems. His current research emphasizes optimization and prescriptive analytics for healthcare operations and medical decision making. He co-authored papers that won the 2016 Manufacturing and Service Operations Management (MSOM) Best Paper award, 2016 MSOM Service Science SIG best paper award, 2010 Pierskalla Award, and two 1st and two 2nd place best paper awards from the POMS College of Healthcare Op's. Mgmt. He has served as Associate Editor for Operations Research, Management Science, Naval Research Logistics, and IIE Transactions, and IIE Trans. Healthcare Syst. Engr. and Senior Editor for Flexible Services & Manufacturing. He was a faculty member of the Northwestern Univ. Sch. of Engr. (1993-2005) and Loyola Univ. of Chicago's Sch. of Bus. Admin. (1999-2005). He has received grant funding from the NSF, ONR, NIH, EPRI, ALCOA, General Motors, and the VA. He has worked in industry for GE Corporate R&D and Lear Siegler's Instrument & Avionic Sys. Div.

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TUESDAY, FEBRUARY 26, 2019

3:30PM – 4:50PM

USC ANDRUS GERONTOLOGY CENTER (GER), Room 206