

# Health Applications Society Online Seminar Series



## Patient Experience versus Efficiency and Methods for Optimization with Machine Learning in Healthcare

**Abstract:** Improving patient experience requires us to incorporate the perspective of the patient and their personalized care needs and desires. Examples include timely access to a future visit, personalized bed unit assignment, coordinated care, and personalized scheduling to care providers. Past models have usually emphasized system efficiency. It is important to include both efficiency and patient experience. Health systems are increasingly sensitive to patient experience, thereby presenting research opportunities. This talk emphasizes timely patient access/scheduling and either stratified or individualized care models for resource allocation. Recent advances are frequently too limited to allow direct application to healthcare for reasons such as personalization as well as the medical, ethical, organizational, and social dimensions. We present approaches to key problems using models with uncertainty/robustness, machine learning, online learning (e.g., multi-armed bandits), and their integration with optimization. Online methods offer a way to cope with limited historical data and to mitigate unpredictable shocks to the system, such as the COVID-19 pandemic.

**Bio:** Mark Van Oyen is a Professor of Industrial and Operations Engr. at the University of Michigan. He received his Ph.D. from Electrical Engineering Systems from the University of Michigan and has worked for GE Corporate R&D and GE Aerospace. His research spans operations management, operations research, systems engineering, data analytics, stochastic control, and industrial engineering. His current research emphasizes stochastic systems, optimization, and prescriptive analytics for healthcare operations and medical decision making. He co-authored papers that won numerous awards including the 2016 Manufacturing and Service Operations Management (MSOM) Best Published Paper, MSOM Service Special Interest Group best published paper, 2010 Pierskalla Award, two 1st and two 2nd place best paper awards from the POMS College of Healthcare Op's. Mgmt., and 2012 INFORMS "Doing Good with Good OR" first prize to his students for joint work. 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. For the INFORMS HAS Society, he was elected as VP in 2019, then served as President (2020) and Past President (2021).

*Professor of Industrial and Operations Engineering*

**Mark Van Oyen**

University of Michigan

**September 24, 2021  
Friday**

11:30am-12:30 pm Eastern Time  
8:30-9:30 am Pacific Time

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