Managing Patients with Chronic Conditions

Mariel Lavieri, PhD
Department of Industrial and Operations Engineering
University of Michigan

Abstract

Chronic disease management often involves sequential decisions that have long-term implications. Those decisions are based on high dimensional state spaces, which pose a problem for traditional modeling paradigms. In some key instances, transition probabilities might not be known, but instead are random variables that are learned as new information becomes available.

As a first step, I describe some of my ongoing research modeling screening, monitoring and treatment decisions of patients with chronic conditions. The models are motivated by diseases such as glaucoma, coronary heart disease and cancer. Key to the models developed is the incorporation of the individual patient's disease dynamics into the parameterization of the stochastic models of the disease state evolution. Model conception and validation is described, as well as the role of multidisciplinary collaborations in ensuring practical impact of my work.

Refreshments will be served in Daniels Hall room 428
from 11:00 a.m. to 11:30 a.m.
Mariel Lavieri, PhD
Department of Industrial and Operations Engineering
University of Michigan
Biography

Dr. Mariel Lavieri is an Assistant Professor in the Department of Industrial and Operations Engineering at the University of Michigan. She has bachelor's degrees in Industrial and Systems Engineering and Statistics and a minor in String Bass Performance from the University of Florida. She holds a Masters and PhD in Management Science from the University of British Columbia. In her work, she applies operations research to healthcare topics. Her most recent research develops dynamic programming, stochastic control, and continuous, partially observable state space models to guide screening, monitoring and treatment decisions of chronic disease patients. She has also developed models for health workforce planning which take into account training requirements, workforce attrition, capacity planning, promotion rules and learning. Dr. Lavieri is the recipient of the Bonder Scholarship, and an honorary mention in the George B. Dantzig Dissertation award. She received the 2009 Pierskalla Award for the best paper presented in the Health Applications Society at INFORMS and mentored students who won the 2012 Doing Good with Good OR and the 2013 Society for Medical Decision Making Lee Lusted Award for Quantitative Methods and Theoretical Developments. Dr. Lavieri was named the 2013 Young Participant with Most Practical Impact by the International Conference on Operations Research.