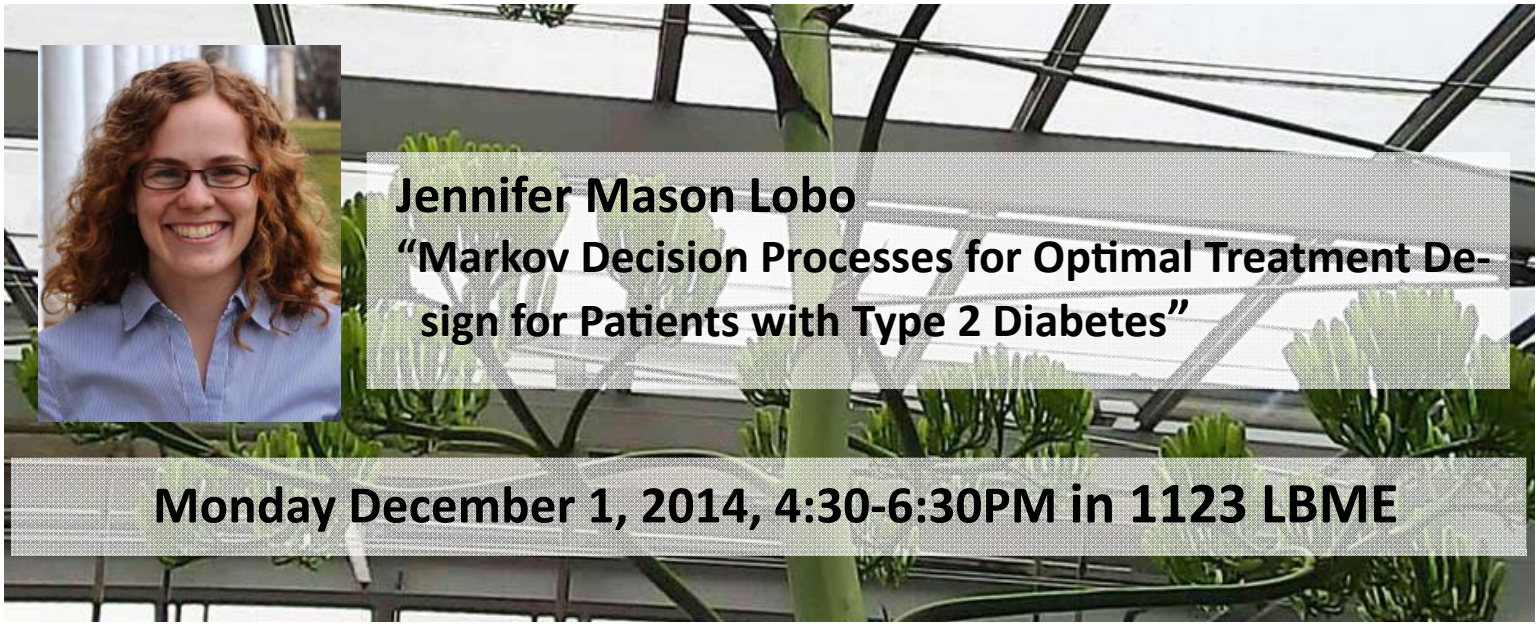

Jennifer Mason Lobo

"Markov Decision Processes for Optimal Treatment Design for Patients with Type 2 Diabetes"

Monday December 1, 2014, 4:30-6:30PM in 1123 LBME

Chronic diseases are the leading cause of death in the United States. Optimal control of treatment for chronic diseases can prolong lives, improve quality of life, and reduce costs. In this talk we present a Markov decision process (MDP) for optimizing treatment for diabetes patients with the goal of preventing adverse events, such as heart attack and stroke. The objective of the MDP is to determine the optimal timing of multiple medications over a patient's lifetime given uncertainty in changes to their metabolic profile over time. Numerical results from this model, calibrated with a large longitudinal dataset from the Mayo Clinic, are presented for the treatment of cholesterol and blood pressure of patients with type 2 diabetes. Two extensions of the model are presented for alternative assumptions about medication use. In the first extension we consider constraints on medication use to reduce polypharmacy, and in the second extension we consider the use of aspirin therapy.

Jennifer Mason Lobo is an Assistant Professor of Biomedical Informatics in the Department of Public Health Sciences in the School of Medicine at the University of Virginia. She received her Ph.D. in Industrial & Systems Engineering in 2012 from North Carolina State University (NCSU), her M.Sc. in Operations Research from NCSU in 2009, and her B.Sc. in Mathematics from the University of South Carolina in 2007. She is the recipient of an AHRQ Dissertation Grant and received third place in the 2013 IIE Pritsker Doctoral Dissertation Award. Her research interests include building mathematical models that describe the natural course of disease for patients with chronic conditions, and optimizing treatment and screening decisions. Her current research involves optimizing clinical decision making for patients with type 2 diabetes, prostate cancer, and renal cell carcinoma.

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For additional information and to be added to the weekly e-mail for the series,
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