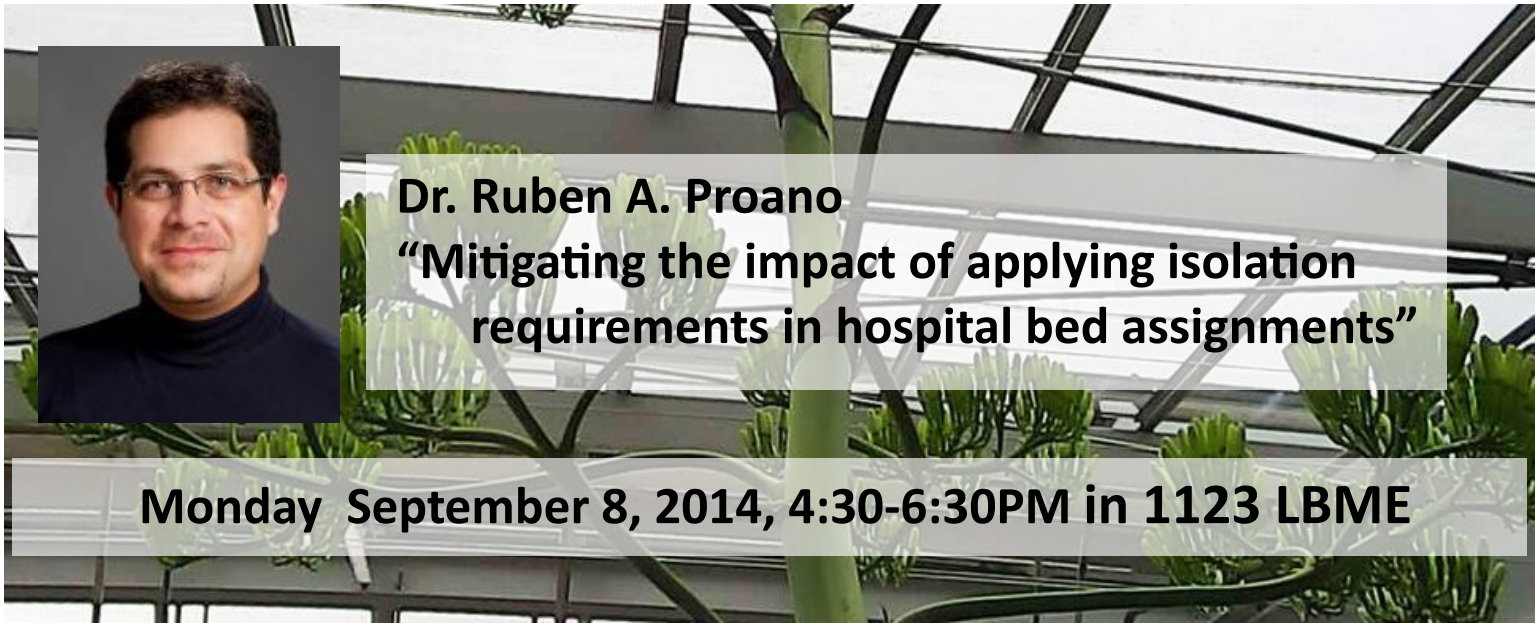

Dr. Ruben A. Proano

"Mitigating the impact of applying isolation requirements in hospital bed assignments"

Monday September 8, 2014, 4:30-6:30PM in 1123 LBME

Many hospital units use a mix of single- and semi-private rooms to cope with hospitalization demand. In order to accommodate new patients when operating at high utilization rates, these units must determine who to admit, and if to make more room, there is a need to transfer those already admitted to different rooms in the unit (i.e., internal movements). These decisions are complicated by the limited number of beds, nursing time availability, and the need to implement isolation guidelines that prevent healthcare associated infections. This study presents a discrete optimization model that suggests for an acute care unit with high utilization levels, how to accommodate admitted and incoming patients in order to enforce all isolation requirements, while trying to hospitalize the most critical patients, and to reduce the number of internal movements. The optimization model is then integrated into a Monte Carlo simulation to evaluate how the unit's configuration affects the number of internal movements. The simulation results indicate that increasing the number of semi-private rooms not only increases capacity, but also the uncertainties associated with patient demand and the number of internal movements, and consequently the effort to transfer patients. This study also illustrates how to determine the number of spare resources necessary to cope with the variability resulting from the number of semi-private rooms in a unit.

Dr. Proano is an Assistant Professor in the Department of Industrial and Systems Engineering at the Rochester Institute of Technology. He received his M.S. and Ph.D degrees in Industrial Engineering from the University of Illinois at Urbana-Champaign. His research work has focused on the application of optimization models to the solution of problems affecting the supply of pediatric vaccines, and the implementation of isolation requirements for preventing HAIs. He is currently interested on data mining approaches for episode-of-care characterization and for early detection of dementia.

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For additional information and to be added to the weekly e-mail for the series, please contact genehkim@umich.edu

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