Optimized Behavioral Interventions: What Does Control Systems Engineering Have to Offer?

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An excellent introduction to the topic of adaptive interventions:


Our initial paper, inspired by [1], on the relationship between adaptive interventions and control engineering:


A report that describes the technical content in [2] in more detail:


A plenary talk I gave in July 2012 at the 16th IFAC Symposium on System Identification (SYSID 2012). This paper summarizes much of our efforts to date:


Work from our laboratory showing how Model Predictive Control can be used for decision-making in adaptive behavioral interventions:


Paper appearing in the inaugural issue of TBM focused on mobile health interventions, to which we contributed some dynamical systems and control engineering perspectives:

These papers show how to represent the Theory of Planned Behavior as a dynamical system, as well as describe approaches to engineering modeling of weight change interventions:


This paper presents a control engineering approach focused on pain interventions:


This paper and presentation study smoking cessation interventions:


Two tutorials on engineering control theory. One was presented at the 2010 Annual Meeting of the Society for Prevention Research; the one at SAMSI (presented in 2007) focuses on mechanistic modeling issues.

Can be downloaded from http://cse1.asu.edu/adaptiveintervention (select item 10).


A tutorial on system identification (i.e., dynamic modeling from data):


A good web-based reference for introductory control engineering theory:


Some good process modeling and control texts; these focus on mechanistic models of engineering systems, and require prior working knowledge of differential equations:


Some good references on Internal Model Control and Model Predictive Control:


Some system identification texts written (or co-authored) by Lennart Ljung, an eminent scholar in the field and developer of Matlab’s System Identification Toolbox:
