

1068-92-66

Michael Malisoff* (malisoff@lsu.edu), Department of Mathematics, 303 Lockett Hall,
Louisiana State University, Baton Rouge, LA 70803-1948. *Controlling Human Heart Rate
Response During Treadmill Exercise.*

We study a recently developed nonlinear model of human heart rate response during treadmill exercise. The state variables are the deviation of the heart rate from the at-rest rate, and an internal state representing local peripheral effects. The controller is the speed of the treadmill. We design controllers and observers that stabilize prescribed heart rate profiles. Our designs can be applied even when the internal state is not available for measurement and are robust to uncertainty in the model parameters and to variation of the treadmill speed from the controller values. This work is joint with Frederic Mazenc and Marcio de Queiroz. (Received January 20, 2011)