Abstract

A number of industrial processes have the behaviour that the process should have as high efficiency as possible. To track a varying maximum or minimum is called extremum control. One major characteristic in extremum control is that the static response curve relating input to output is inherently nonlinear, and we therefore assume that the process can be divided into the linear part and nonlinear part in series. If the nonlinear part is placed before linear part, it is called input nonlinearity. On the contrary it is output nonlinearity. A Hammerstein model is employed for a process with input nonlinearity, and an extremum control law is then derived based on the model. For a process with output nonlinearity, two cases will be discussed according to that the intermediate signal between linear part and nonlinear part can be measured or not. If the intermediate signal can not be measured, a state-space model will be used for parameter estimation, and the EKF, RPE and a modified recursive prediction error method with line search will be implemented.