Multiple model predictive control of nonlinear pH neutralization system

ABSTRACT

In this paper the control of nonlinear systems using linear models is studied. The control strategy utilizes a piecewise linear description of the process, considered the model bank. The model bank is then combined at each sampling interval, through the application of a Bayesian weight calculator, to render a single linear model describing the system. The linear model is used in a model predictive control (MPC) setting to render the optimal control move. The performance of the setup is simulated for a pH neutralization process, which demonstrates a good following of setpoint changes and quick reduction of oscillations.