Abstract

Continues Stirred Tank Reactor (CSTR) is widely used in chemical industries and to get high productivity and quality from CSTR the control of various parameter is an important issue. Neural Network based Model Predictive Controller (NNMPC) refers to a class of control algorithms that compute a sequence of manipulated variable adjustments in order to optimize the future behaviour of a plant. In the present study NNMPC is implemented in Neural Network Toolbox of Matlab software that calculates the control input to optimize CSTR performance over a specified future time horizon using minimization routines based on five different line searches. These five conjugate gradient based line searches are namely, Golden section; Bent's; Hybrid bisection cubic; Charalambous and Backtracking line searches. Performance analysis of CSTR output response and error convergence plot indicates that the brent's line search based minimization routine gives best result as compared to other line searches and the NNMPC utilizing Brent's line search based minimization routine controls the output concentration effectively.
References


Index Terms

Computer Science  Information Sciences

Keywords

Continuous stirred tank reactor, Matlab, Model predictive control, neural network, System Identification.