Abstract

Tracking of nonlinear dynamic plants under external disturbances is presently an active area of research. The main difficulty felt in the tracking of nonlinear dynamic plants under external disturbances is the computational complexity in control design. This paper presents a simple neural network internal model control (IMC) approach for off-line tracking of unknown nonaffine nonlinear discrete time systems subject to external disturbances. The proposed control scheme is based on the neural network plant model and the inverse model. These models are determined using input output data. The final neural network IMC approach, including network plant model and the inverse model, is work off-line for tracking nonaffine nonlinear discrete time systems subject to external disturbances. Simulation results have been presented toward the end of the paper to illustrate the effectiveness of the proposed control strategy for tracking unknown nonaffine nonlinear discrete-time systems with and without external disturbances.

Index Terms
Keywords
Input-output approximation  Inverse model  Multilayer perceptron  Nonlinear Internal Model Control (IMC)

Nonaffine nonlinear discrete-time system

Single input single output (SISO) systems