

Article Abstract

Title:	Neuro- PI controller based model reference adaptive control for nonlinear systems
Author(s):	R. Prakash ¹ , R. Anita ²
Address(es):	¹ Department of Electrical and Electronics Engineering, Muthayammal Engineering College, Rasipuram, Tamilnadu, INDIA-636102, prakashragu@yahoo.co.in ² Department of Electrical and Electronics Engineering, Institute of Road and Transport Technology, Erode, Tamilnadu, INDIA-638316, anita_irtt@yahoo.co.in
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Abstract:	The aim of this paper is to design a neural network based intelligent adaptive controller. It consists of an online multilayer back propagation neural network structure along with a conventional Model Reference Adaptive Control (MRAC). The training patterns for the Neural Network (NN) are obtained from the conventional PI controller. In the conventional model reference adaptive control (MRAC) scheme, the controller is designed to realize plant output converges to reference model output based on the plant which is linear. The NN is used to compensate the nonlinearity of the plant that is not taken into consideration in the conventional MRAC. The control input to the plant is given by the sum of the output of conventional MRAC and the output of NN. The proposed Neural Network -based Model Reference Adaptive Controller (NN-MRAC) can significantly improve the system behavior and force the system to follow the reference model and minimize the error between the model and plant output. The effectiveness of the proposal control scheme is demonstrated by simulations.
Keywords:	Model Reference Adaptive Controller (MRAC), Artificial Neural Network (ANN), Proportional-Integral (PI) controller