The paper presents a new design of adaptive and dynamic neural network-based controller architecture with feedback connection for non-linear multivariable systems. The network is trained on-line at each sampling interval using the desired output trajectory and the training method used is the Real Time Recurrent Learning Algorithm (RTRL). The recurrent network is a fully connected one, with feedback from output layer to the input layer through a delay element. Since the synaptic weights to the neurons are adjusted on-line, this controller has potential applications in real time control also. Moreover, it can be used for both continuous and discrete systems. The simulation results obtained by applying the algorithm to a non-linear multivariable system demonstrate the effectiveness of the proposed method.

Reference
RTRL Algorithm Based Adaptive Controller for Non-linear Multivariable Systems

Nonlinear Multivariable Systems Using Neural Networks and Approximate Models., Journal of applied sciences


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