



## **NEURAL NETWORK-BASED ROBUST TRACKING CONTROL FOR ROBOTS**

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**ABSTRACT**—An adaptive robust tracking controller is proposed for robot systems under plant uncertainties and external disturbances. Nonlinear robust control theory and neural network design are combined to construct a hybrid adaptive-robust tracking control scheme which ensures that the joint positions track the desired reference signals. Neural network is used to identify the uncertainties, and the effects on tracking performance attributable to the approximation errors of NN are regarded as external disturbances that are attenuated to a prescribed level by robust controller. The neural network weights are only tuned on-line without tedious and lengthy off-line learning. A simple robust learning algorithm of neural network is derived such that the proposed adaptive controller can easily be implemented and the stability of the closed system can be ensured. A simulation example demonstrates the effectiveness of the proposed control strategy.

**Key Words:** Adaptive robust control, neural network, robotic tracking control.