

# Two-Stage Neural Network Architecture for Feedback Control of Dynamic Systems

STEPHEN M. PHILLIPS AND CHRISTOPH MÜLLER-DOTT\*

*Department of Electrical Engineering, Case Western Reserve University, Cleveland, OH*

**Abstract.** In this paper we investigate system identification and the design of a controller using neural networks. A two-stage neural network design for controllers using single-layer structures with functional enhancements is introduced. This neural network architecture allows the design of a controller with less a priori knowledge about the plant as well as allowing for nonlinear plants. The paper also addresses the special characteristics and problems concerning the use of neural networks in control and demonstrates their performance by showing the successful implementation of a nonlinear control example via simulation.