

FIGURES FOR CHAPTER 6

**DYNAMIC NEURAL NETWORKS AND THEIR APPLICATIONS TO CONTROL
AND CHAOS PREDICTION**

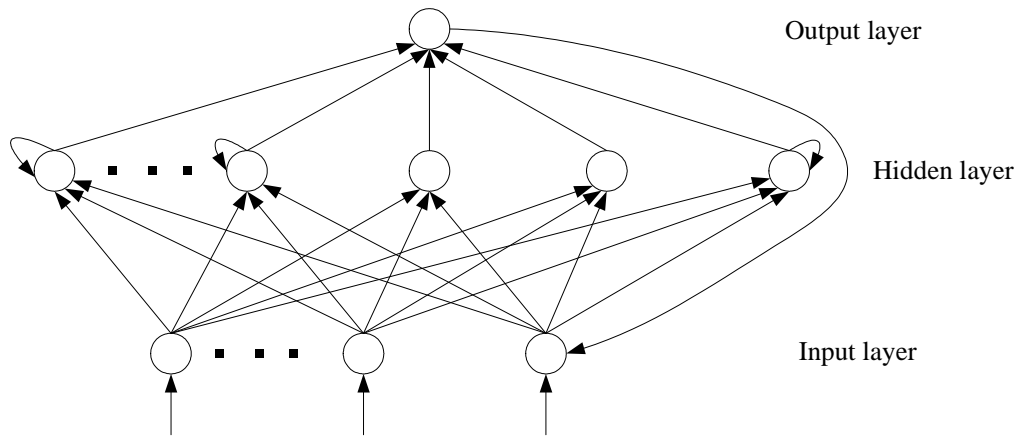


Figure 6.1. A typical structure of recurrent network

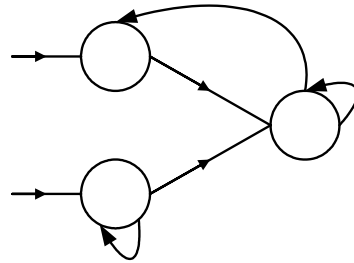


Figure 6.2. Feedback signals among neurons of RNN

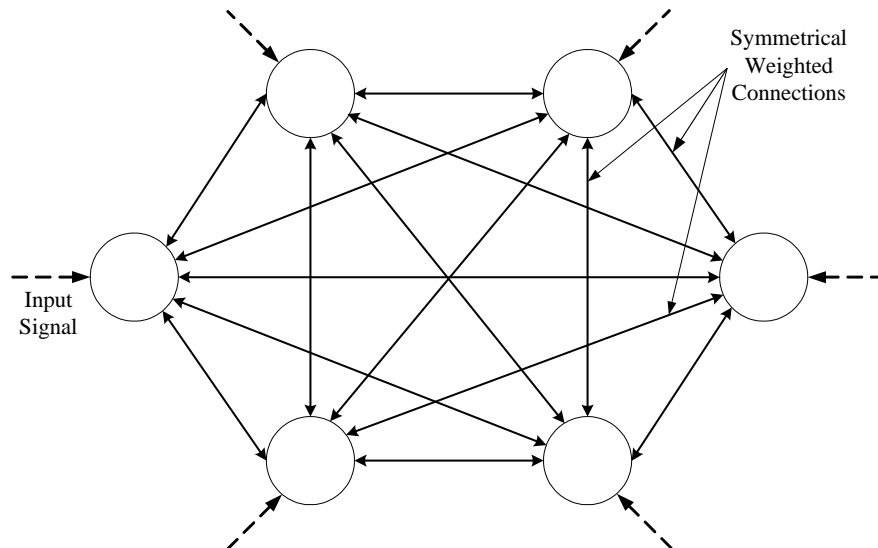


Figure 6.3: Typical representation of the Hopfield Neural network

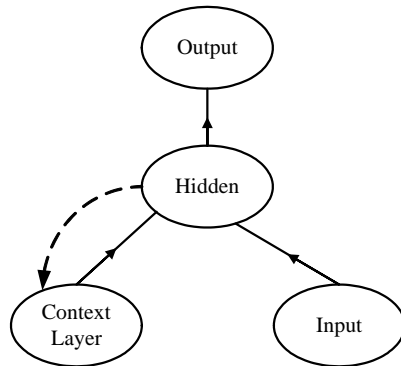


Figure 6.4. Architecture of a simple recurrent network (Elman Network)

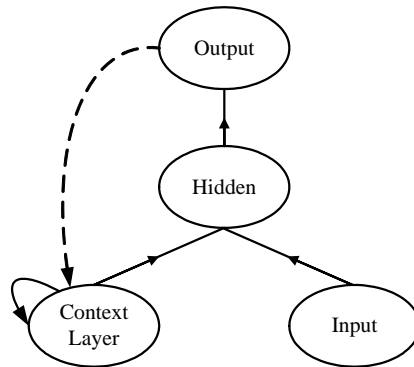


Figure 6.5. Architecture of Jordan's sequential network

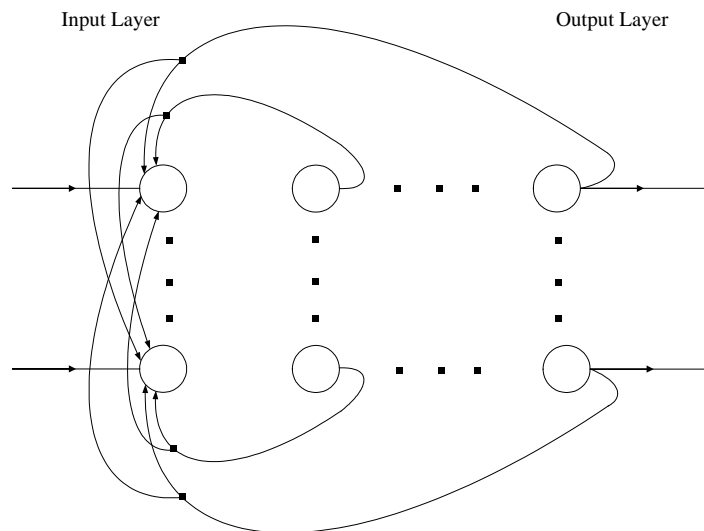


Figure 6.6. Architecture of a fully recurrent network

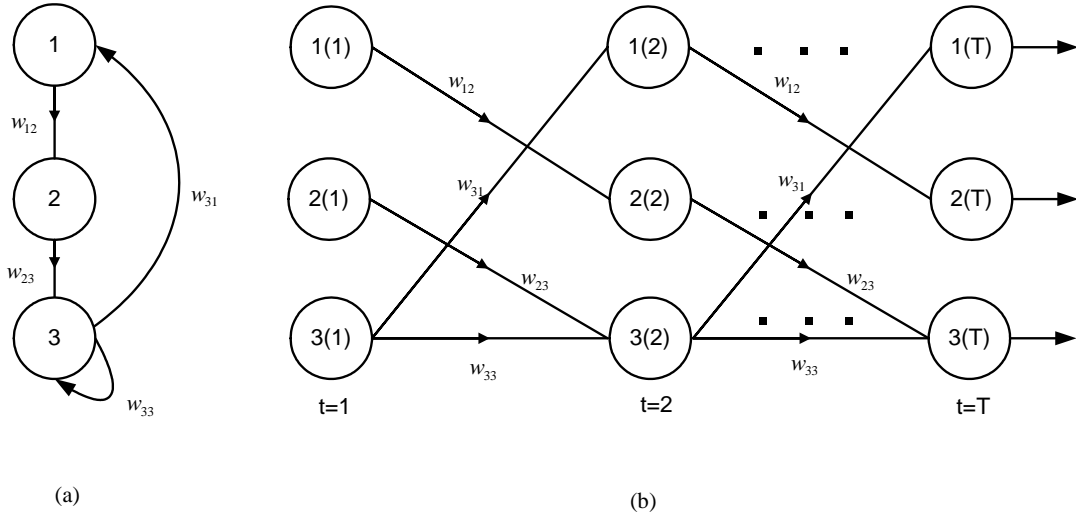


Figure 6.7. Three-unit recurrent network (a) and its feedforward network equivalent (b)

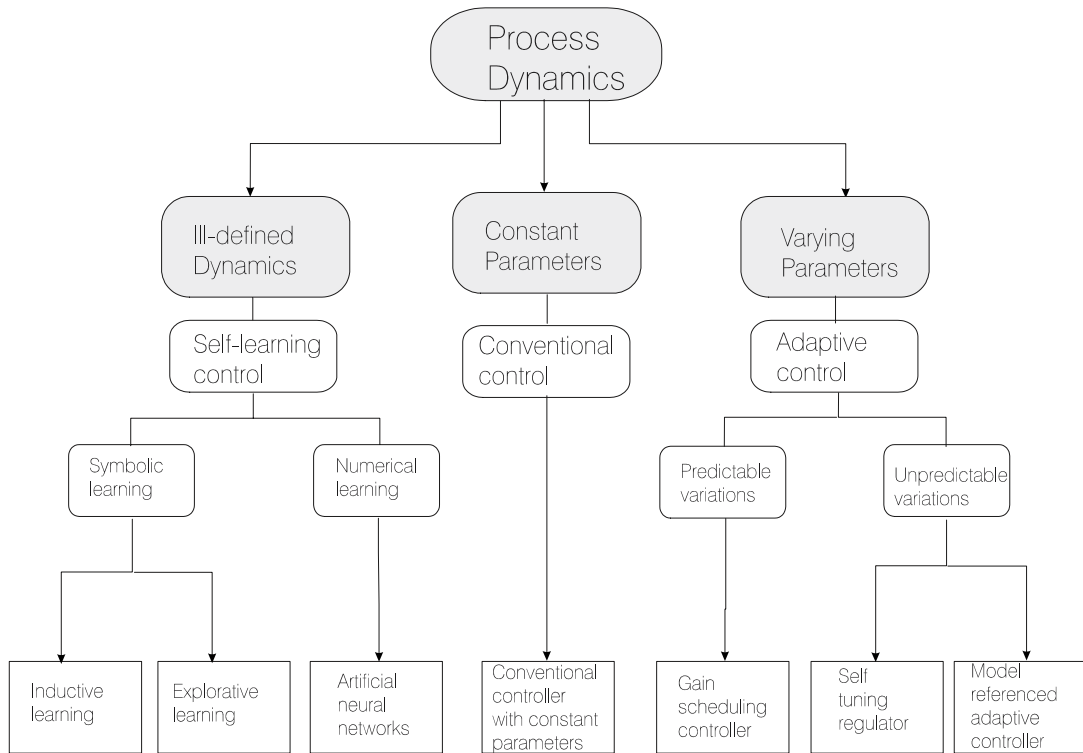


Figure 6.8 Classes of dynamic systems and their appropriate controllers

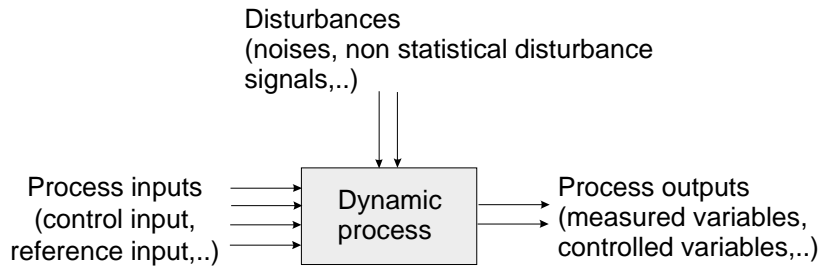


Figure 6.9: Block diagram of a dynamic system

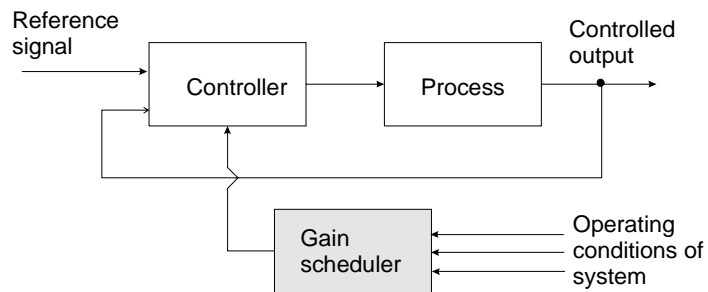


Figure 6.10: Block diagram of the gain scheduling controller

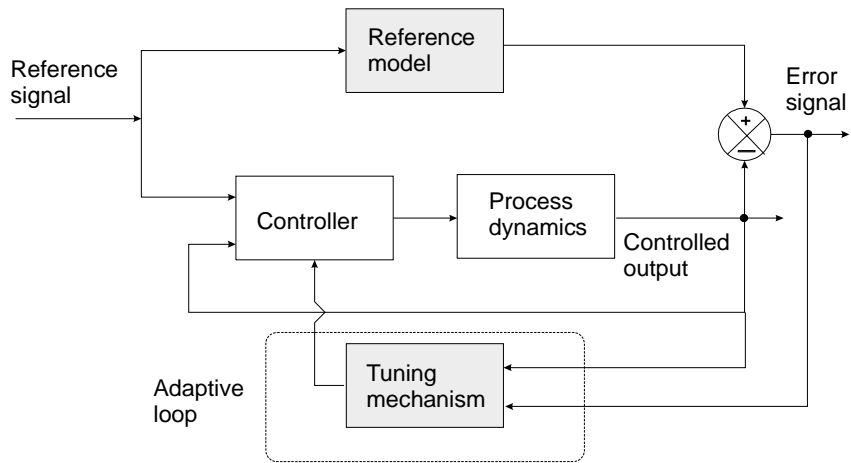


Figure 6.11: Block diagram of a model-referenced adaptive controller

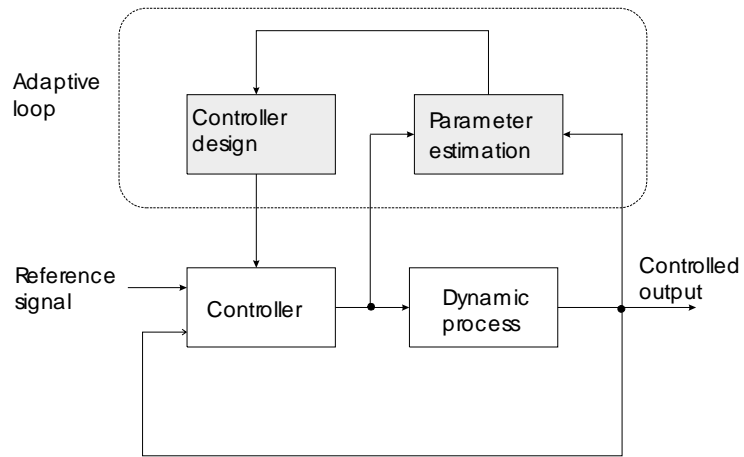


Figure 6.12: Block diagram of the self-tuning regulator

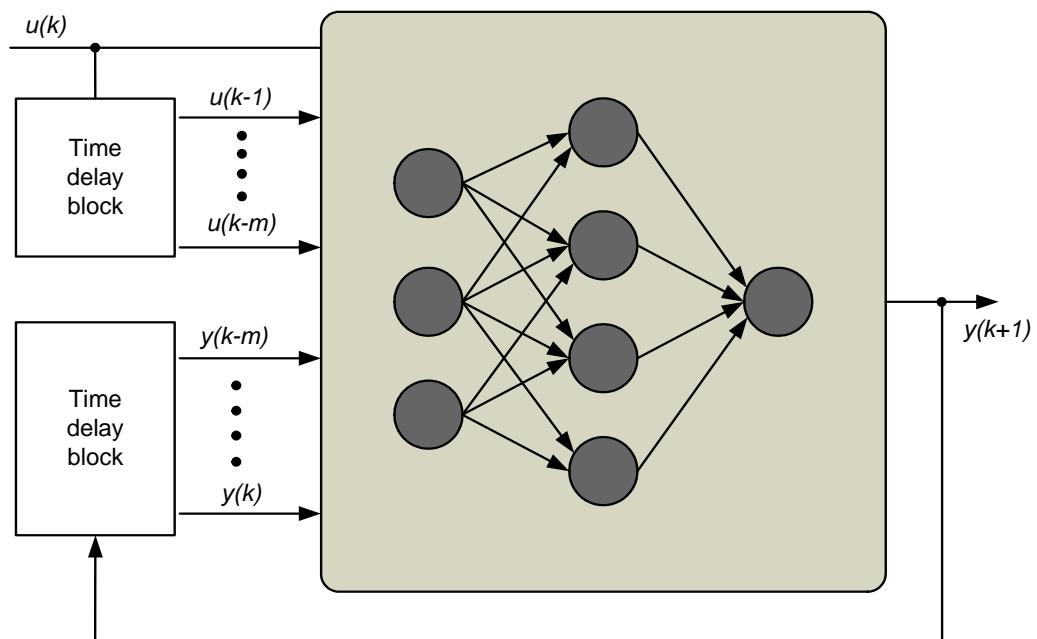


Figure 6.13. Time delayed recurrent neural network

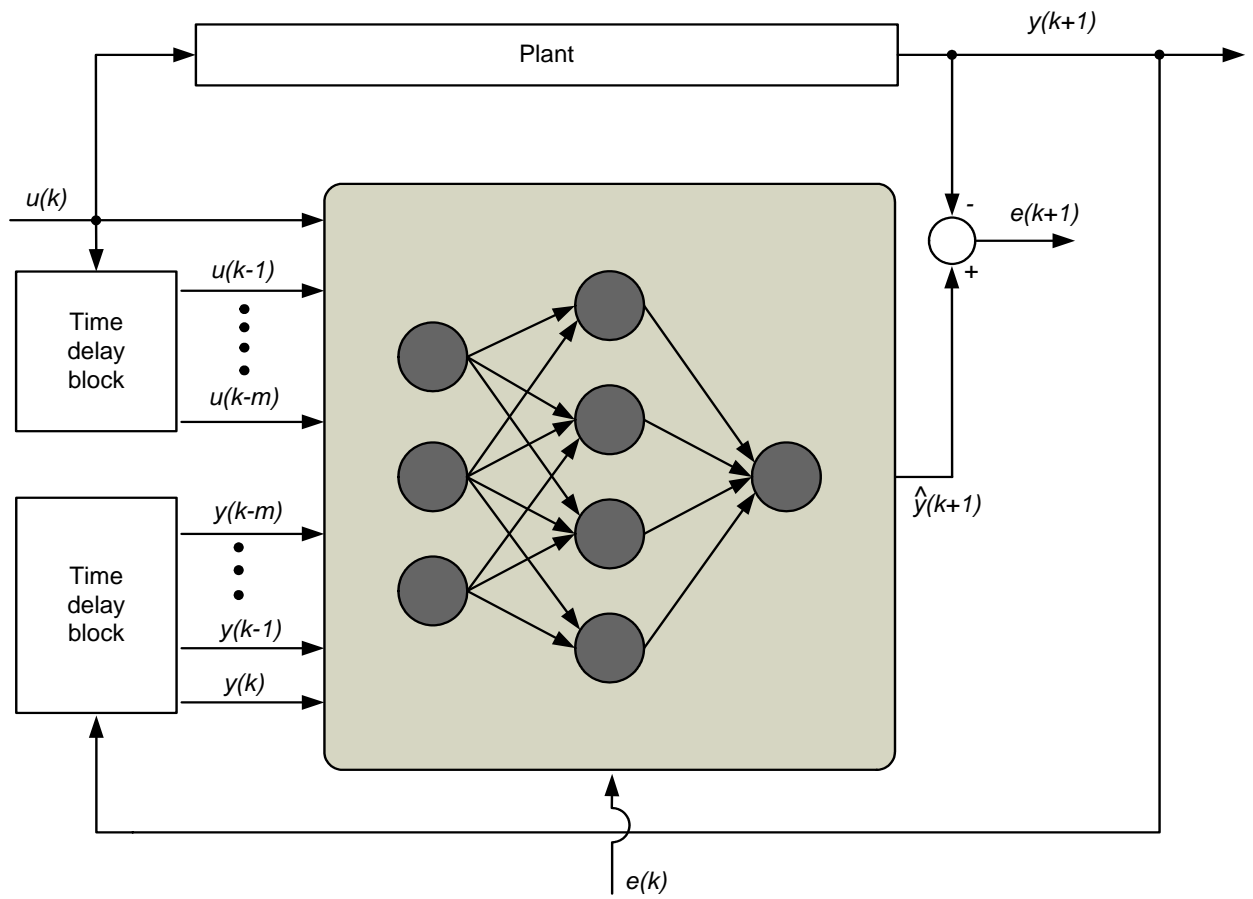


Figure 6.14. Series-parallel scheme for neural identification

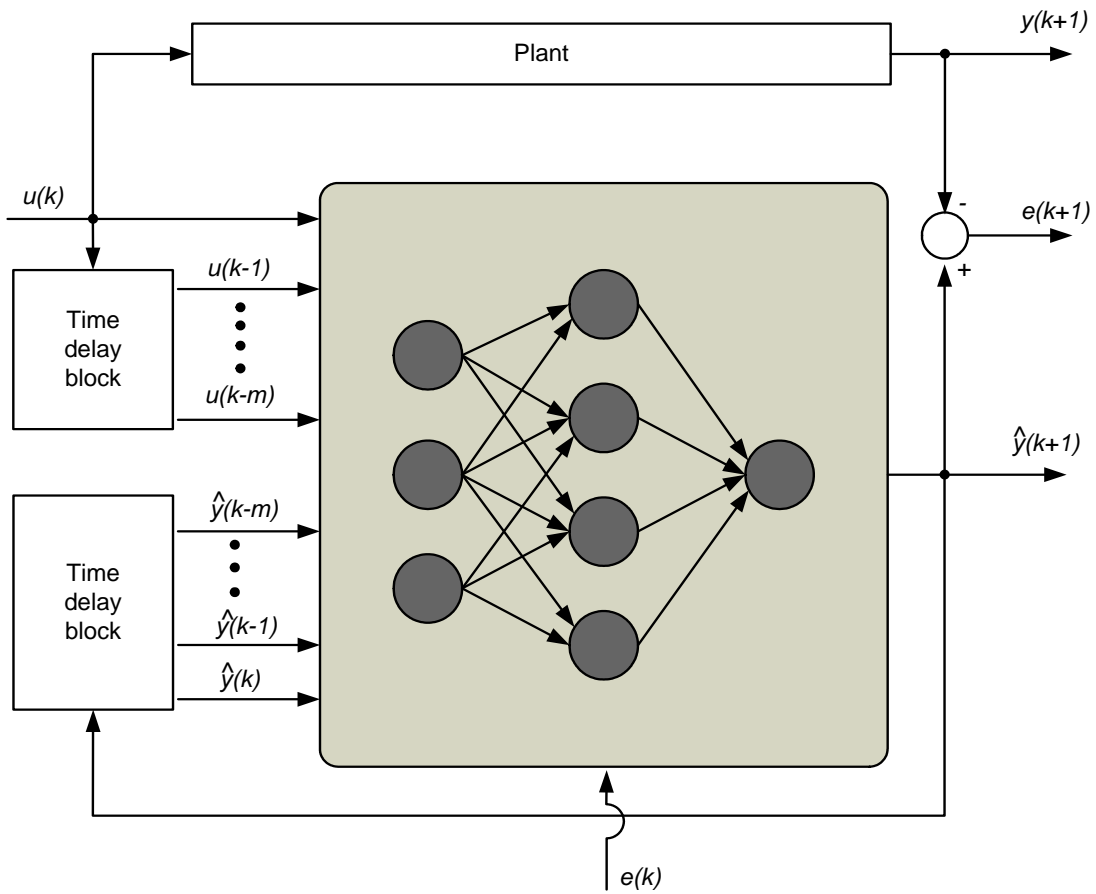


Figure 6.15. Parallel scheme for neural identification

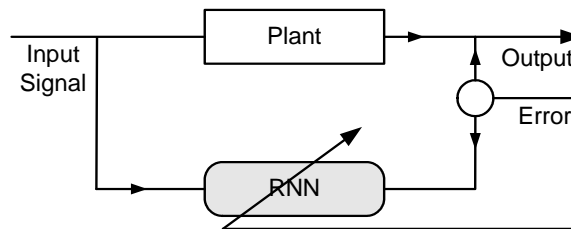


Figure 6.16. System identification using RNN

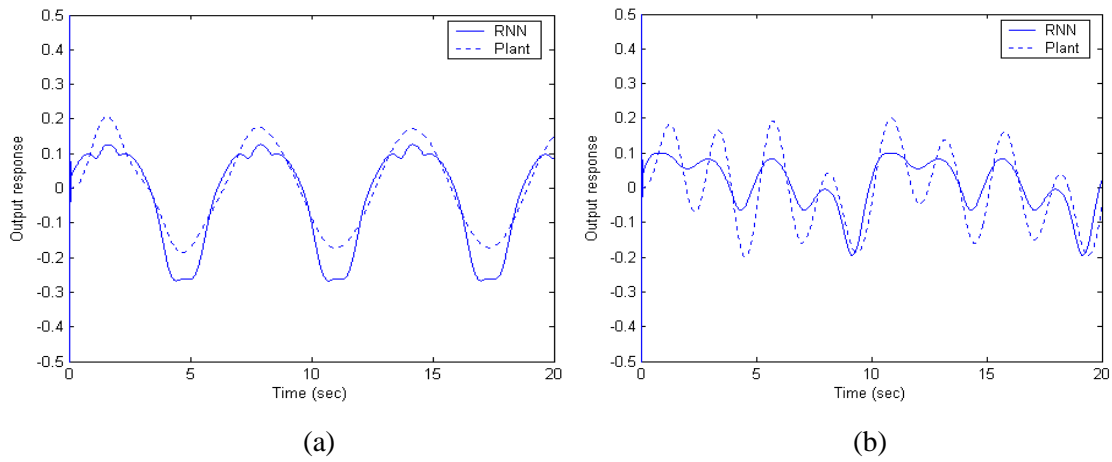


Figure 6.17. (a) Identification results with first set of input, (b) Identification results with second set of input

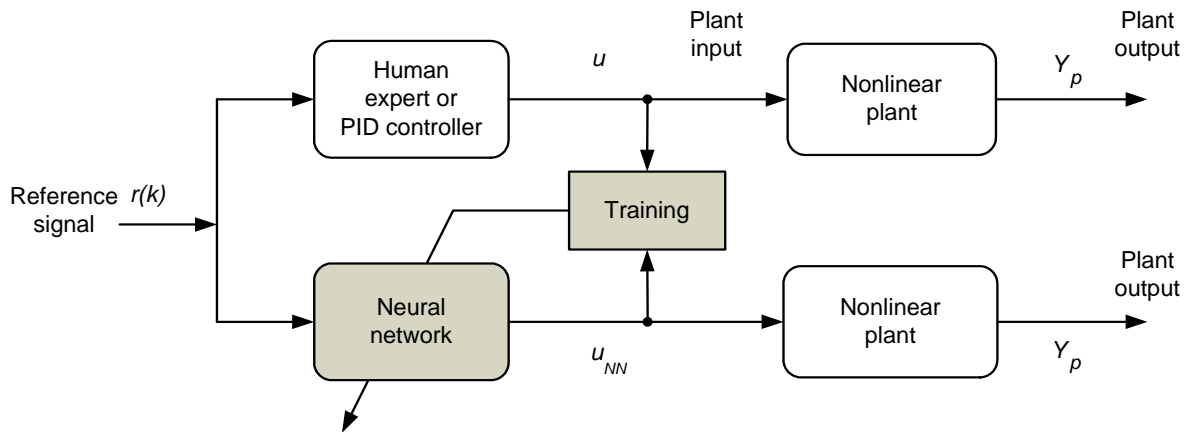


Figure 6.18. Neural network acting as a supervisory controller

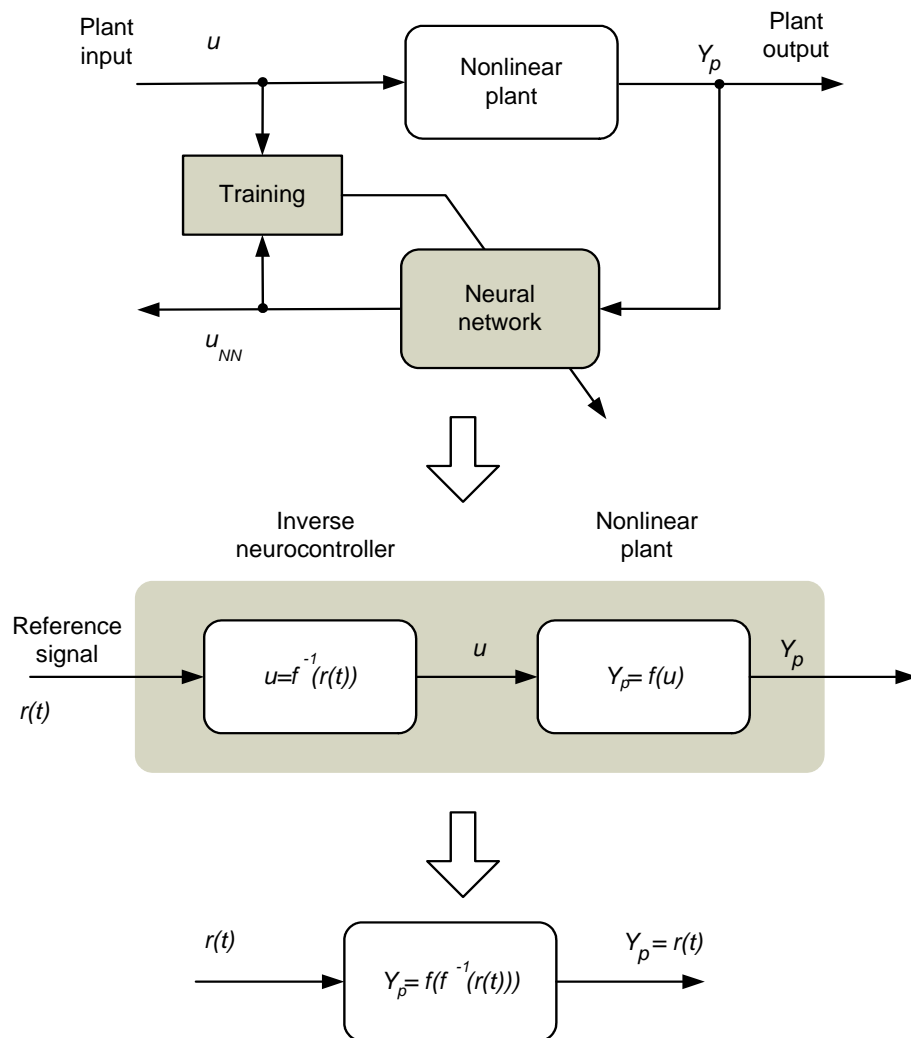


Figure 6.19 Neural network as inverse model based controller

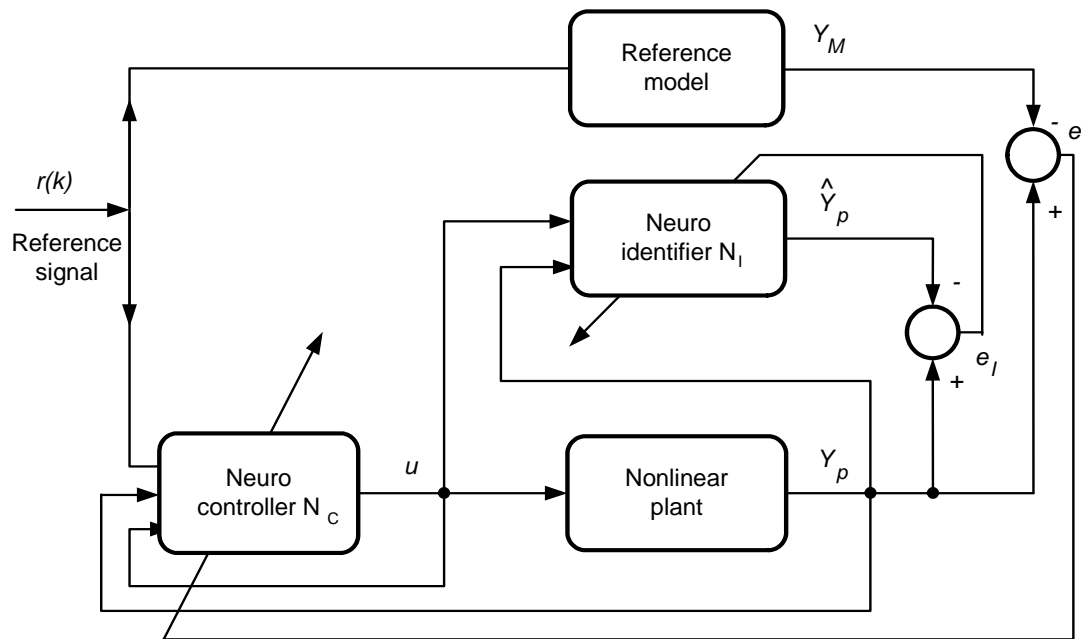


Figure 6.20 Neural network as Neuro Adaptive Controller.

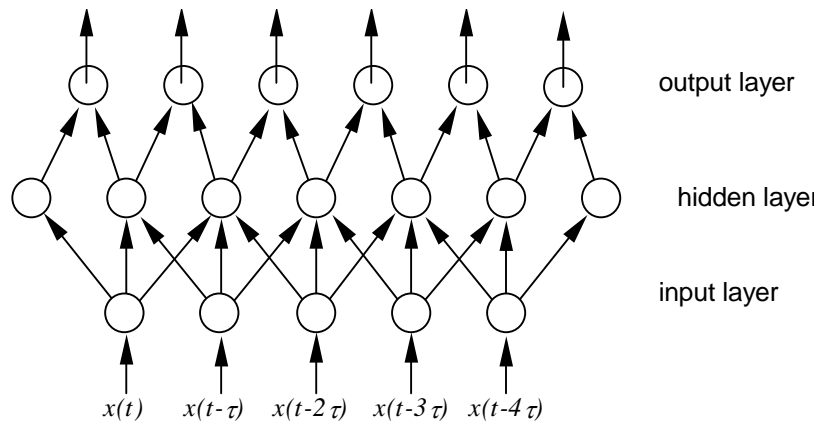


Figure 6.21: Model of single-input time-delay neural network. Inputs are successively delayed by τ units, with hidden layer elements depending on current and two delayed inputs. Outputs depend on two delay units only.

Mackey-Glass Time Series ($\tau=17$)

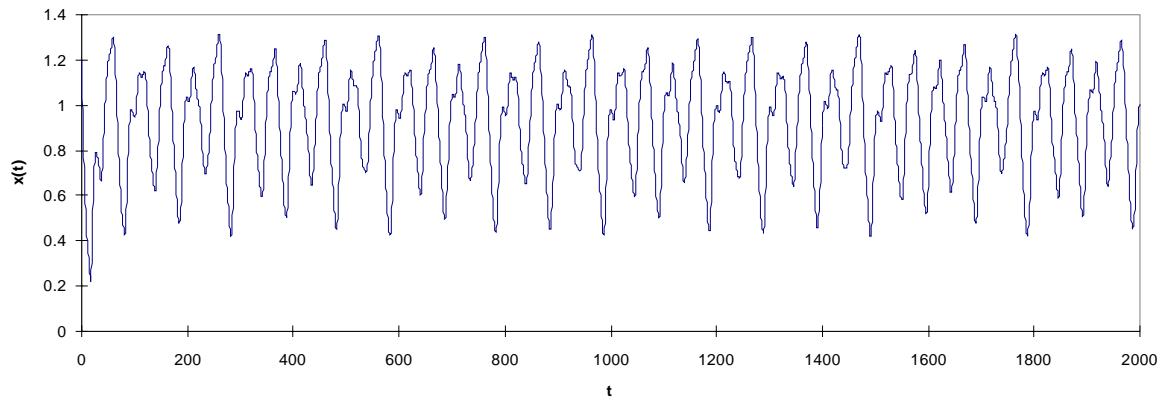


Figure 6.22: Mackey-Glass time series.