

AN ADAPTIVE NEURAL NETWORK BASED CONTROLLER FOR MACHINE TUNING OF ELECTRONIC CIRCUIT BOARDS

ABSTRACT

A neural network based controller is disclosed which is designed to control multiple electronic circuit boards (10) which share an approximate input-output relationship. However, these boards (10) usually deviate from one another due to shifts and noise found inadvertently in their respective components. The neural network controller described operates in an on-line manner i.e. weights of the associated neural networks are adaptively altered for optimum generalization performance while the control process runs concurrently. The on-line mechanism enables the neural network controller (20) to detect any significant change in the board's characteristics, hence generating appropriate control actions. In order to ensure good approximation capability, a novel method for management of training data is employed in which the input space is segmented into discrete, disjoint partitions and only one training pair is allowed to occupy the designated partition. By using a neural network, complex and non-linear relationships in circuit boards such as TV chassis boards (10) can be mass produced.

Fig. 4