Abstract

Learning in Back-error Propagation networks depends essentially on many factors . One of these factors is the patterns that are used in network training, Whenever these patterns are expressive their results increases the network generalization ability, and conversely .

This work introduces Genetic Algorithm usage to select appropriate patterns for learning back propagation neural network in order to exhibition generalization characteristic of the network . To explain the aim of the research three different figures are selected, square, isosceles right triangre, and circle to represent its variation in order to show the capability to represent it in simple parameters to reduce the data to lower limit, Hence storage reduction .

The appropriate patterns mean that the appropriate position and size of figure for learning , the network to enable recognition of another patterns. To find appropriate patterns crossing mechanisms (Crossover & Mutation) are applied, and evaluate population chromosomes to find the best chromosome that includes the best four patterns for each figure .

The chromosome evaluation among the population chromosomes depends essentially on its fitness function. In this work, error value resulted from recall unknown patterns in training the network on specific chromosome in the population is the chromosome with lowest fitness value .

Neural network with 225 nodes in input layer, 12 nodes in hidden layer, and 3 nodes in output layer was implemented. Every pattern fed to network input nodes to obtain its recognition code by excitation one of its output nodes.

The search work manifest that genetic algorithm success in finding the desired patterns in efficient form, and proved the network ability of generalization in spite of patterns high variation in position and size