Face Recognition System Based on Different Artificial Neural Networks Models and Training

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***Abstract*— Face recognition is one of the biometric methods that is used to identify any given face image using the main features of this face. In this research, a face recognition system was suggested based on four Artificial Neural Network (ANN) models separately: feed forward backpropagation neural network (FFBPNN), cascade forward backpropagation neural network (CFBPNN), function fitting neural network (FitNet) and pattern recognition neural network (PatternNet). Each model was constructed separately with 7 layers (input layer, 5 hidden layers each with 15 hidden units and output layer). Six ANN training algorithms (TRAINLM, TRAINBFG, TRAINBR, TRAINCGF, TRAINGD, and TRAINGD) were used to train each model separately. Many experiments were conducted for each one of the four models based on 6 different training algorithms. The performance results of these models were compared according to mean square error and recognition rate to identify the best ANN model. The results showed that the PatternNet model was the best model used. Finally, comparisons between the used training algorithms were performed. Comparison results showed that TrainLM was the best training algorithm for the face recognition system.**