ABSTRACT

COMPARISON OF ARTIFICIAL NEURAL NETWORK METHODS BACKPROPAGATION AND LEARNING VECTOR QUANTIZATION IN FACE RECOGNITION

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Face recognition is an area that is still studied and developed for various purposes such as attendance, population data collection, security systems and others. Methods of artificial intelligence in particular artificial neural networks backpropagation and learning vector quantization are two methods that often used for facial recognition applications. Both methods are supervised learning methods that usually used for a typical pattern recognition, classifying patterns into classes of patterns, making it perfect for use in facial recognition applications. Comparison of artificial neural network methods backpropagation and learning vector quantization used in face recognition to be able to know the difference, deficiency, excess and optimal results from both methods to be used in face recognition.

Development of comparison of artificial neural network methods backpropagation and learning vector quantization using waterfall paradigm and object-based programming with UML diagrams. In these applications use image processing to process the input image before the image inserted into the ANN, including the process of scaling, grayscale, edgedetection with sobel method and thresholding. While the ANN methods are used to recognize faces are backpropagation and learning vector quantization method.

The results of this research is the best parameter combination of learning vector quantization is the maximum iteration is 10, the learning ratio is 0.1 and a minimum of errors is 0.1. While backpropagation is the maximum iteration is 50, the ratio is 0.5 and a minimal learning error is 0.001. In terms of accuracy and timing, learning vector quantization method is better than the backpropagation method. With this level of recognition accuracy 37.63% and the average time of 32 milliseconds, at 675 times of face recognition on 25 facial images with 27 combinations of learning parameters.

Key words: Face recognition, Artificial Intelligence, Artificial Neural Networks, Backpropagation, Learning Vector Quantization.