

Abstract

The face is one part that has a very important role in human life. Through face recognition techniques, a variety of information can be obtained.

Despite having a very important role in face recognition system, face detection received less attention in research community. Whereas before we could get any information from a face, first of all the face itself need to be obtained in advance. Face detection system provides many challenges and difficulties that must be faced that there are diverse variations caused by the appearance of the face on the image, also the complexity of the background image.

In this thesis, the method used polynomial GMDH Neural Network (PNN) to detect the occurrence of faces in an image. PNN will divide the local region on multiscale sliding windows into two classes, namely the face and not the face by using the input image data that has made the reduction process to reduce the computational complexity dimensions using Nonlinear PCA. Classification was done by using soft-classification.

From the test results can be known-PNN GMDH network and the level of reduction NLPCA resulting system accuracy of 99.87% for training data and accuracy of 81,96% for testing data.

Keywords : Face detection, *Nonlinear PCA, GMDH, Polynomial Neural Network*