

# Digital Image Processing for Face Detection and Expression Analysis

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## ABSTRACT

Nasolabial folds are the wrinkle around the mouth that can be used to mark facial expressions. In this study, nasolabial folds were used to identify happy smile expressions on facial images. The recognition consists of 2 main stages. The first stage for facial area detection is carried out using the viola-jones algorithm, then the second stage for identification of happy smile expressions is performed using artificial neural network (ANN), i.e. the backpropagation algorithm. The processing of feature extraction exploits the calculation of the area of the nasolabial folds in the segmented image. The data of feature extraction is then used as input for the process of training and testing of the backpropagation neural network. The accuracy rate of the system for identifying happy smile expressions on 150 facial images is 92% for training dataset and 82% for testing dataset.

Kata Kunci: *Nasolabial folds, happy smile recognition, backpropagation*