

ABSTRACT

Driver's drowsiness is one of main cause traffic accident which cause physical injuries, economic loss, even death. In case to decrease that percentage of traffic accident, we need a system which can detect the drowsiness. Drowsiness detect system has been designed by some researcher using various methods. There was a researcher who detects the drowsiness by letting the driver use tools like glasses. However, that way often ignored by the driver because it is not practical and even can disturb the driver's comfort in driving.

This final project designs a drowsiness expression detection system using the Histogram of Oriented Gradient (HOG) method and Support Vector Machine (SVM) classifier. This drowsiness expression detection system utilizes image processing to get the object's face expression. The dataset of this research is 10 seconds .mp4 video format in RGB color space. The face detection of object sample in each video is done by using Viola-Jones algorithm. After the face is detected, the extraction is done by using HOG method to get the characteristic value of face image. With this characteristic value, the face image of an object sample is classified by SVM which will determine the face image into three classes as a representation of normal, weary, or drowsy expression.

This designed system uses block size and cell size, coding design multi-class SVM, and bins number scheme for testing phase. The dataset that is used for testing phase is 45 test videos which are the videos of 15 individuals on each condition. Then, the train data that is used is 5314 images which are the frames of 45 train videos. From that testing phase, the optimum system performance is obtained at 2×2 block size, 6×6 cell size, 9 bins number, OAO SVM multi-class configuration. The accuracy system at that configuration is more than 87% with the computational time is 1,108 seconds each frame.

Keywords : *drowsiness, face detection, viola-jones, histogram of oriented gradient, support vector machine*