Driver Drowsiness Detection System Based on Binary Eyes Image Data

Abstract:

In this paper, driver drowsiness detection algorithm based on the state of eyes of the driver which is determined by his iris visibility has been implemented. If eyes remain in one state either open or closed longer than expected time as well as if the driver is not looking straight front, it is an indication that driver is drowsy and then the system warns the driver. System is capable of detecting the state of eyes with or without the regular glasses. Matlab with image processing tools has been used to process the image provided by a camera. Matlab creates System Object using Viola Jones algorithm to detect the objects such as nose, mouth or upper body. After capturing an image, rectangular eyes area was adjusted to reduce the noise. RGB to Gray scale and finally to Binary image conversion is with a suitable threshold value. A median filter was used to reduce the noise and then the image was smoothened. The drowsiness detection is done based on the conditions like Black to White pixels ratio, number of pixels in the column greater than the threshold value and eye's shape. Light and position of the driver plays an important role. System can be set to self-learn at startup to setup threshold values.

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