Driver fatigue detection and alert system using non-intrusive eye and yawn detection

Abstract

Driver fatigue is one of the leading causes of car accidents in the world. Detecting drowsiness and alerting the driver is the easiest way to prevent mishaps. The purpose of this paper is to develop a fatigue detection and alert system. This system works by analyzing the eye closure duration and yawn frequency of the driver and alerting the driver by activating LEDs, buzzers and sending warning messages to his emergency contacts. The alerts are divided into three stages of severity to take action accordingly. Facial features for determining alertness were obtained by using a camera capturing the face of the driver. The system can monitor the driver’s eyes to detect early stages of sleep as well as short periods of sleep lasting 3 to 4 seconds. The application is implemented on a Raspberry Pi minicomputer with a NoIR camera, making the system economical and portable. The system not only provides an effective way to detect fatigue but also provides many forms of alerts to control the situation and compel the driver to take a break.
References


Index Terms

Computer Science

Information Systems
Keywords

fatigue detection, road safety, image processing, early warning, facial landmark, Haar cascade, regression trees, Bluetooth Low Energy, GPS.