vehicle

Almost every vehicle has currently installed black box since the stored images by black box can be used to investigate the exact cause of the accident. One of the most important aspects in an accident investigation is the license plate detection and recognition as the license plate has information about the driver and car. This paper presents a novel algorithm for license plate detection and recognition using black box image. The proposed license plate recognition system is divided into three stages: license plate detection, individual number and character extraction, and number and character recognition. The Gaussian blur filter is used to remove noise in the image and then we detect the license plate edge using modified Canny algorithm. Second, we determine license plate candidate image using morphology and support vector machine. Finally, we recognize the numbers and characters using k-nearest neighbor classifier. The experimental study results indicate that the license plate detection and recognition algorithm has been successfully implemented.

Drosy

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.

Smart helmet

Currently, accidents are a serious problem for everyone. Accidents are increasing day by day, so efforts are made to avoid them to minimize their consequences. We live in a world where the rules of the road have no importance for people and they are regularly violated. In addition, its human nature to resist what is imposed on them. Thus, using a different perspective, we provide safety with luxurious and intelligent features using a smart helmet. Two modules one on the helmet and bike each will work in synchronization, to ensure that the biker is wearing the helmet. A radio frequency module is responsible for the wireless communication between the helmet and the bike circuit. The Piezo electric buzzer is used to detect speeding and this feature is extended by limiting the speed of the user. The ALCHO-LOCK function is used to prevent drink and drive scenarios Accelerometer detects accidents, and this is extended by employing GSM module in our circuit, which is designed to automatically send one message to one personal contact and one concerned authority that the person has been into an accident and a fog sensor for increasing visibility in case of fog or smog are also used. Another feature known as E-HELMET allows for automatic deduction of the required amount from the users virtual wallet wirelessly preventing the rider to stop and pay for it.

The most important aspects in an accident investigation are the license plate detection and driver drowsiness detection. License plate detection uses the novel algorithm. It is divided into three stages: license plate detection, individual number and character extraction, and number and character recognition. The Gaussian blur filter is used to remove noise in the image and then using modified Canny algorithm the numbers and characters are recognized using k-nearest neighbor classifier. Driver drowsiness detection algorithm is based on the state of eyes of the driver which is determined by his iris visibility. 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.It uses Viola\_Jones algorithm to detect the objects such as nose, mouth or upper body and captures the image. After capturing an image, rectangular eyes area was adjusted to reduce the noise.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. The ALCHO-LOCK function is used to prevent drink and drive scenarios.

A license plate detection and recognition is one of important processes in investigating a car accident since license plate has information about driver and vehicle identification. Currently, almost all vehicle black boxes store only driving images so it is not easy to detect and recognize license plate correctly. To overcome this problem, we propose an algorithm that automatically recognizes license plate using a vehicle black box image in this paper. Fig. 1 shows the Korean license plate and Table 1 shows the format. The new license plate format is made up of ## (letter) #### where # is a number. This license plate is available in a size format similar to the license plates used in the European Union, 520 mm wide by 110 mm tall. The color scheme is a simple design which is black and white[1]. This paper uses these features to detect license plate.

Cars are becoming smarter and smarter nowadays as new technology is evolving. Cars can sense roads, environment and driver behaviors. Car manufactures are adding new safety features. It is found that the contributing factors to traffic accidents are driver’s behavior which are mainly drowsiness, impaired driving and distraction [1]. Among these factors, driver drowsiness is the major cause of mortality traffic accidents worldwide [2]. Driver Drowsiness Detection is one of the car safety feature that helps prevent accidents caused by the drowsy driver. Driver drowsiness cause many accidents every day. According to the National Highway Traffic Safety Administration (NHTSA), more than 1,550 people are killed and 71,000 are injured each year as a direct result of drowsy driving. According to the National Sleep Foundation’s Sleep in America poll, 60% of adult drivers (168 million people) have driven a vehicle while feeling drowsy. 37% (103 million) people have actually fallen asleep at the wheel [3]. Thus, driver drowsiness detection feature is very important to prevent accidents and save lives. This paper is organized as follows: Section 1 gives introduction, and Section 2 explains the current drowsiness techniques. The Section 3 explains the steps involved in processing the image. Results are presented and discussed in Section 4 and the last section concludes the paper.

It is a well-known fact that young generation prefers bikes and motorcycle over four wheelers. A survey indicates that more than 70% of the riders avoid wearing helmet without any specific reason .Moreover speeding and drunk driving have become common issues. Due to lack of experience or focus and violation of traffic rules, result in severe accidents. So with the help of technology we made sure that traffic rules are followed, problems mentioned above are avoided and their effects are minimized.

The idea of developing this work comes from our social responsibility towards society. In many accidents that occur around us, there is a huge loss of life. According to a survey, about "7500" people die on roads per year that occur due to bike accidents. There are various reasons for accidents such as not having adequate ability to drive, defective two wheelers, rash driving, "drinking and driving", etc. But the main reason was the absence of helmet on that person which leads to immediate death due to brain damage. Therefore, it is important that there should be a facility to minimize the after effects of these accidents. However the main goal of our work is to make it mandatory for the rider to wear a helmet during the ride meanwhile providing solutions to other major issues for accidents. Therefore, this sense of moral responsibility towards society, laid the foundation for our "Smart Helmet" project. So the basic idea for the development of this project "Smart Helmet" is taken from [1] [2] And detail functionality of each of hardware and software components used are, for example, the radio transceiver is taken from [3] and the information and operation of the sensor [4]. The main component used is microcontroller 89S52. The principles of operation of the circuits and connections, etc. are taken from references [5] and [6]. Therefore, all references have contributed to the development of the project.

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