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Pedestrian detection using image processing for an effective traffic light controlling system

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Abstract

Traffic congestion and road pedestrian accident are the two major issues that the Sri Lankan society faced toady. These two issues can be reduced by use of traffic light controlling system in an effective way. This research paper proposed a system to make effective PEdestrian LIght CONtrolled (PELICON) crossing system using image processing. The proposed system consists of three major parts. That is CCTV camera, the system, and pair of poles with standard traffic light system. First the system captures an image of pedestrians who are waiting to cross the road, using CCTV camera. Then the system processes the image to identify and detect the number of pedestrians. Finally, if the number of pedestrians exceeds a given threshold value or pedestrian waiting time is exceeded, then the logical part of the system works and produces a result to control the traffic light system. This system that uses PELICON crossing system could be more effective than a button clicking PELICON Crossing system.

Keywords: Color detection, Image processing, PELICON crossing system, Traffic congestion

Introduction

Traffic congestion of Sri Lanka is a noticeable problem in the society. Today it has become a major problem in some major cities in Sri Lanka, like Colombo. Both of the vehicles and pedestrians represent most dominant users of road space with roads heavily congested with traffic. According to the survey, 15,000 buses, 10,000 trucks and 225,000 private vehicles, enter Colombo city daily (Edirisinghe, 2014). However, there is no proper method to handle both vehicles and pedestrians. There are 10 major entry corridors to Colombo city, with an estimated number of 750,000 people arriving daily to the city by road using 200,000 vehicles (Weerawardana, 2011). With increased imports of vehicles, the traffic congestion problem will only steadily increase. The Government and other policy makers proposed various solutions for this problem. But, still there is no reliable and efficient solution.

In addition, road accidents have become an appreciable problem. Most of the road-accidents occur while the pedestrian is crossing the road. Pedestrian have rights to cross the road safely. Nevertheless, there is a huge deficit in the provision of pedestrian controlling units in Sri Lanka. Pedestrian fatalities in Sri Lanka account for 40% of all road deaths. In Colombo district, this is as high as 70% of all accident statistics, with pedestrian constituting around 39% of them (Fernando, 2011).

These two major problems fiectly affect the Sri Lankan economy. The economic cost of accidents has been valued at over Rs 10,000 million annually in Sri Lanka (Kumarage et al., 2003). While considering these two problems, it is important to use efficient traffic controlling system for urban areas in Sri Lanka.