

Intelligent traffic controller using image processing

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Abstract

Traffic congestion has become significant problem in recent years with the ever increasing number of vehicles and poor management of traffic. Traffic patterns are not constant throughout the day. They are changing from time to time. Since present traffic controllers have fixed time intervals for signal lights, they could not provide a better solution. Computer vision can be used to create an intelligent traffic controller which can adapt its time intervals according to the real traffic. Several studies have been carried out based on the concept of real time image processing to manage the traffic. In current traffic controllers, wastage of effective green time is occurred, as many times fixed green time period which is assigned for a phase is larger than it actually needs. Hence the other roads at the intersection have to wait in vain, with more traffic, until that fixed green time period is over. In the proposed method real time traffic image sequences are analysed using image processing, in order to obtain actual traffic area. Then, time for green light is allocated according to that traffic area. Hence, wastage of effective green time is eliminated by the proposed method since it allocates time to green signal that is sufficient to pass the actual traffic presented on the road. Results reveals, effective green time that need to pass the traffic, is proportional to the road area covered by traffic at that time.

Keywords: Effective green time, Image processing, Intelligent controlling of traffic, Traffic area

Introduction

Today, traffic congestion has become an important issue to be solved throughout the whole world. This creates a heavily bad impact on national development as well as human routine, as this leads to many problems such as air pollution, sound pollution, weariness, stress, time and energy waste. Since traffic patterns are dynamic and constantly changing, fixed time sequenced signal lights cannot adapt to the changing traffic patterns. Hence, a better solution regarding this problem is, implementing an Intelligent Traffic Control System which operates in real time, by adjusting signal timing to accommodate changing traffic patterns.

A variety of approaches to these tasks were suggested by many scientists and researchers, using different techniques of Image Processing which are based on vehicle counting methods (Fathy and Siyal, 1999), (Aher and Shaikh, 2015), image comparison methods (Choudekar et al., 2011), (Abbas et al., 2013), and traffic area methods (Gaikwad et al., 2014; Mokashi, 2015).

There are many situations such as, heavy incoming traffic only from several sides of the intersection while the rest are relatively empty. In this case, people on the heavily occupied side have to wait for a long time while, the road, containing low traffic display green signal without having vehicles to move as the green light time duration is fixed for all sides. This leads to a wastage of effective green time as well as creating more traffic in other roads. Therefore, there is a dire need for a smart system that can