SmartGo - Intelligent Traffic Controlling System with Violators Detection

Dissanayake D.M.B.W.D.K.[1], Aluvihare W.B.W.M.R.U.P.U.[1], Weerasooriya K.T.N[1], Rajapaksha K.D[1], Gunarathne G.W.D. A[1], and Pemadasa M.G.N.M[1]

[1]Faculty of Computing, Sri Lanka Institute of Information Technology, Sri Lanka.
it19207650@my.sliit.lk, it19209944@my.sliit.lk, it19207964@my.sliit.lk, it19152110@my.sliit.lk, dimuth.a@sliit.lk, nadeesa.p@sliit.lk

Abstract

Road traffic is mostly regulated by Traffic Light Control Systems (TLCS) in Sri Lanka. Conventional traffic signals have many problems, including unproductive time management at road intersections. Drivers and pedestrians would prefer to use the TLCS without any difficulties. The study aims to implement a system on a real-time basis using video monitoring and image processing technology. The system will facilitate vehicles to pass the traffic lights within a minimum waiting time and utilize time according to the number of disabled persons. Emergency vehicles will be released soon by detection using real-time data processing. This system includes the highest vehicle count detection accuracy level, nearly 92%. and the red-light violators detection system with an accuracy of 88.6%. SmartGo also detects emergency vehicles and smooths the way of passing through the traffic lights, including a YOLOv5 model with an accuracy of 82.3%. Subsequently, a fine-tuning YOLOv5 is then used to detect vehicles and pedestrians. According to experimental data, the suggested method provides a detection accuracy of 90%. SmartGo is a comprehensive system different from the existing traffic light control system in Sri Lanka which provides flexible and efficient service to both drivers and pedestrians.

Keywords

Traffic Congestion, Traffic Management, Image Processing, Highest Vehicle Count, Disabled Persons, Red Light Violators, Emergency Vehicles