License Detection and Accident Prevention System

P.D.R Dewmin[1], P.S.H Yapa[2], and S.D.Lokuge[2], Nelum Amarasena[2], G.N.M. Premadasa[2]

[1]Department of Computer Systems and Network Engineering, Sri Lanka Institute of Information Technology, Sri Lanka.

[2]Department of Information Technology, Sri Lanka Institute of Information Technology, Sri Lanka.
ranul.dewmin@gmail.com, sandaru1213@gmail.com, sayurulokuge@gmail.com, nelum.a@sliit.lk, nadeesa.p@sliit.lk

Abstract

According to census and statistics department of Sri Lanka, more than 30,000 accidents occurred from 2013 to 2019. More than two thousand are fatal in this time-period. When considering the top 10 causes of deaths in Sri Lanka, road accidents is at 10th place. Drink and drive, fatigue, drowsiness, distracted driving and driving without a valid license are root causes to these accidents. 20% of the accidents are caused by the drivers without a valid driving license. Currently there is no automated system built using IoT to verify driver's license. A system to check drowsy driving, distracted driving and driver intoxication is also lacking in the society. By analyzing the data, smart license detection and accident prevention system was proposed to identify and validate driver's license using RFID. The proposed system also facilitates sub-systems to check driver's drowsiness, fatigue, alcohol level and driver distracted or not using Raspberry Pi camera module based on computer vision using TensorFlow Lite. An initialized sub-system detects the intensity of the brake pedal being engaged using pressure sensor. The system analyzes the pressure and indicate the intensity level accordingly using the brake light brightness. While these sub systems reduce the probability of occurring an accident, airbag detection sub system reduce the fatality rate of an accident by detecting the deployment of airbags and informing the nearest police station and hospital about an accident using GSM module and SMS Gateway API. The proposed system will reduce the number of accidents occurring throughout the year.

Keywords

Vehicle Accident, IOT, GPS, GSM, Raspberry Pi, Computer Vision, Pressure Sensor, Accident Prevention