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Smart Traffic Clearance System for Emergency Vehicles

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Abstract:- The current time-based traffic management system is the least adaptable and least suited to the traffic of today. This made it difficult for many emergency vehicles, including ambulances and fire trucks, to do their duties when. The current Traffic management systems must undergo a significant modification due to the increasing number of vehicles. There are systems that effectively regulate traffic in urban areas using image processing technologies. However, because they are more complicated and expensive, these technologies can only be used in poorer nations. The suggested solution develops an Android application that uses a cloud network to link the traffic signal station and the ambulance. By temporarily retaining a green traffic signal, this system implements intelligent traffic signal control using RFID (radio frequency identification) technology.

Keywords*: traffic management system, emergency vehicles, Patient, RFID, GSM.*

1. Introduction

Traffic congestion is only one of the numerous issues the world is experiencing as a result of rising population and a rapid increase in the number of automobiles. In developing nations like India, the rate of road construction is just a third of the rate of vehicle growth. Statistics indicate that while the number of vehicles is currently growing annually by about 11%, the number of new roads being built each year is still only about 4%. Increased traffic congestion has a wide range of implications. Through delayed services (such as ambulance and fire services), fuel waste, and unfavorable environmental effects, congestion impedes economic progress. Everyone must be able to get where they are going quickly.[1][2] However, the majority of them don't really leave early to be there sooner. The main cause of fatality in ambulances is this.

The emergency car must navigate a number of city traffic lights. The ambulance must spend more time in traffic to get to the hospital if the number of vehicles in a given region is at its peak for a longer period of time.[3] The presence of an ambulance in a certain traffic lane is not detected by the timer-based traffic control system that is currently in use. When an ambulance is present, the local traffic authorities in that region will be aware of it and will adjust the traffic signal to allow the ambulance to pass through road intersections. This setup is ineffective.

2. Proposed System

The major goal of the suggested Model is to avoid having the ambulance become trapped in traffic. There is a chance that the patient will die if the ambulance gets stuck in heavy traffic.[4] This system can be used to reduce traffic congestion.[5] In this research, we provide a wireless communication- based intelligent traffic management system that can relieve traffic congestion.

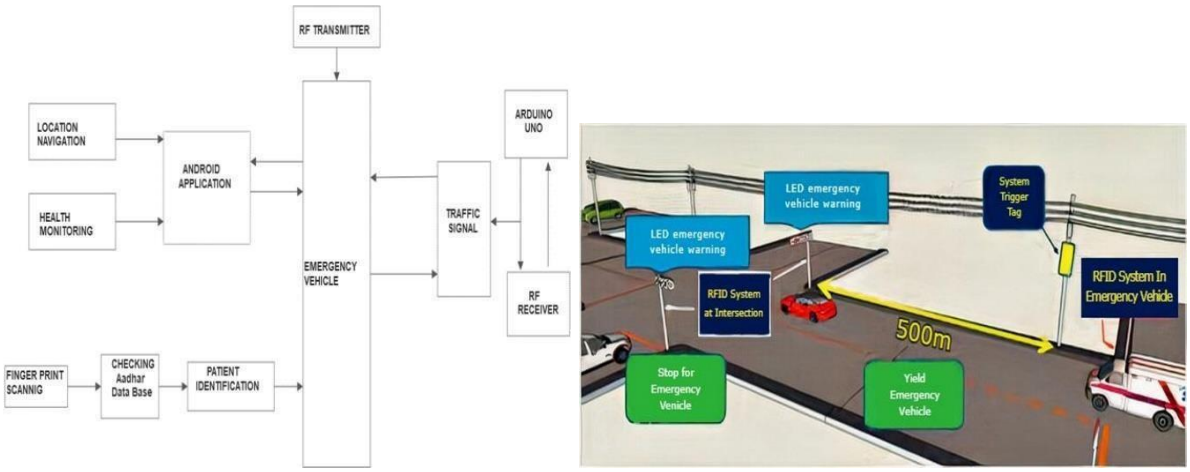

Figure. 1 (a) block diagram, (b) animation model

3. Working Principle

The working part has three modules namely-emergency vehicle section, traffic section and finally the destination section. The working of this project is an application is designed which is to get the accident spot or the location to be communicated to the ambulance driver, which would give the list of nearest hospitals in and around the surroundings

3.1. Emergency Vehicle Section

The first module is the ambulance session which consists of a web application and the emergency vehicle part the application is mainly used for two purpose one is to navigate the driver and other is to communicate the patient's condition and identify the nearest hospital. [6]This application would also suggest the driver about the hospital's facility available to treat that particular patient in case if the patient turn to be unconscious then at that time his information can be gathered from the aadhar card databased by scanning his fingerprint.

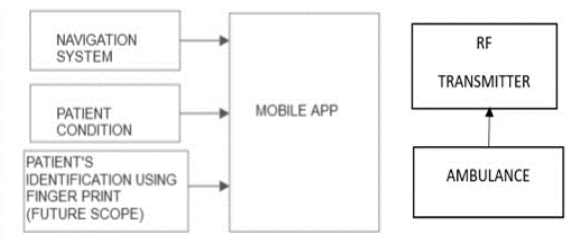

Fig 2: Block Diagram for Vehicle part Application

3.2. Traffic Signal Section

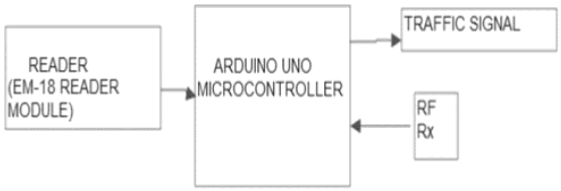

Fig 3: Traffic Signal Section

Figures 3 depict the installation of RF receiver tags before 1 km and 750 m of the signal so that whenever the ambulance with the RF transmitter reached the RFID coverage, the traffic light would automatically turn to green to pass the signal without any delay. This will help clear traffic jams prior to the arrival of the ambulance. RFID (Radio Frequency Identification) is a technology that uses radio waves to connect with tags or labels that are attached to items. In this case, an RFID transmitter is being used. [7] In this proposal, emergency vehicles have RFID tags affixed to them to identify them and activate traffic signals to allow the vehicles to pass through traffic easily. RFID READER WITH ULTRA HIGH FREQUENCY The primary element used in this project is seen here.[8] The RFID reader gets a signal from the transmitter and uses it to locate the RFID tag that is affixed to the emergency vehicle. The Arduino microcontroller is used to regulate the traffic signals and create a clear passage for the emergency vehicle to pass through after the RFID tag has been identified

3.3. Destination Section

Hospitalized patients' criteria and an ambulance can be sent to doctors by SMS. As a result, the doctor is able to prepare in advance for medical care. The GSM module is used for this.[9] In this project, the GSM (Global System for Mobile Communications) module is also utilized to send SMS warnings to the emergency services, letting them know where and how the emergency vehicle is doing.

The main advantage of this system is low cost of implementation and mainly ensures the life of patient also Patient’s Details are provided to the hospital to take pre-preparation based on the severity of the patient. The future scope of this project is to add Aadhaar identification of Patient’s through his fingerprint, which helps to recognize person if the patient state is unconscious.

4. Conclusion

The primary purpose of the proposed system is to manage signals in favor of emergency vehicles. When the traffic intensity along the route is supported by automatic traffic signal regulation, the human labor of the traffic policeman is decreased. Since the entire system is automated, little human interaction is necessary. The hospital will receive a text message on the patient's health so that treatment plans may be formed, which can enable the ambulance arrive at the hospital without any delays and on time. Ambulances and fire trucks, among other emergency vehicles, must reach their destinations as fast as possible. If they spend a lot of time in traffic, several people's lives, which main danger, may also be in danger. The traffic signal turns green as soon as an emergency vehicle has passed the intersection.

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