

Mobile Application to Detect Approach of Crisis Vehicle

P.K.Reejesh¹, V.Hariharan², M.Radhakrishnan³, R.Ganesh Moorthy⁴ and Mishmala Sushith⁵

¹UG Scholar, Department of Information Technology, KIT-Kalaignarkarunanidhi Institute of Technology. Email: pkreejeshpk203@gmail.com

²UG Scholar, Department of Information Technology, KIT-Kalaignarkarunanidhi Institute of Technology. Email: hariharinfo@gmail.com

³UG Scholar, Department of Information Technology, KIT-Kalaignarkarunanidhi Institute of Technology. Email: krishnarudeboy@gmail.com

⁴Assistant Professor, Department of Information Technology, KIT-Kalaignarkarunanidhi Institute of Technology. Email: krishnarudeboy@gmail.com

⁵Associate Professor & Head, Department of Information Technology, KIT-Kalaignarkarunanidhi Institute of Technology. Email: mishmala@gmail.com

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ABSTRACT

At Present, the number of vehicles plying on the roads has increased, leading to heavy traffic, particularly in the intersection of roads. This drastic increase in vehicles has caused risk to Emergency Vehicle drivers. They lose a lot of time, struck in traffic jams and confusion among people in giving way to the Emergency Vehicles. So we are developing a Mobile Application to detect the approach of an Emergency Vehicle and warn the people who are on the way or near the ambulance. The traditional siren and lights prove not to be helpful when there is lot of traffic and noise. We believe our system will be better and effective. We plan to use GPS (Global Positioning System) to detect the position of the Emergency Vehicle and alert people within a circle of the GPS location.

Keywords: Traffic Clearance, Emergency Vehicle, GPS and Application.

1. INTRODUCTION

Day by day, the population and number of vehicles that have infested the city have made life miserable for mankind. An Emergency Vehicle, approaching a traffic signal struggles to find its way through the traffic. We can partly blame men for using vehicles excessive besides his needs, but one more reason stands.

It is that people are unaware of Emergency Vehicles approaching. With this heavy traffic and noise, and with an enormous queue at the traffic signals, the man at the front doesn't even know that an Emergency Vehicle is striving to get its way past the traffic. Watching these activities, made us to think of a solution to the problem. An alert to the people of the vicinity that an Emergency Vehicle is approaching. This would help to clear up traffic, as soon as the Emergency Vehicle approaches or even before the Emergency Vehicle approaches.

A Smart Phone, equipped with GPS can be used as a good form of communication to alert the people, since almost everyone has a Smart Phone. An Emergency Vehicle can use an application that sends its current location to a server, and that server can broadcast the approach of the Emergency Vehicle to people who are near it. The common man should also have this application installed in his mobile to get the alert sent by the server. It is good to note that only the persons, who are within a certain range to the Emergency Vehicle will receive the alert, this reduces the burden to send messages to everyone and instead, we send alerts to the persons only in the nearby location.

The project can be divided into three modules, one for the Emergency Vehicle Driver, one to keep track of GPS Location of the persons using the app, and another module for alerting the people.

1.1 The Emergency Module

This is the module used by the Emergency Vehicle drivers. When they enter into this module, their GPS Location will be sent to the server. The server will then do the proceedings. The good thing about this module is that after a single click, they need not worry and think about which path may be flooded with traffic, since alert reaches the people, well before, the Emergency Vehicle can drive through without any intervention. Here we have to send a request to the server to broadcast the alert.

1.2 The Server

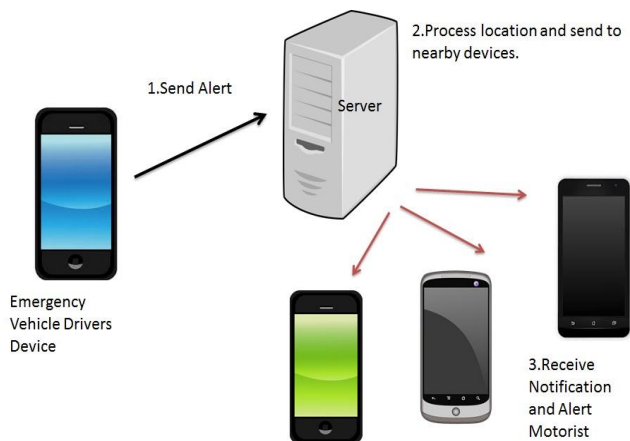
The server maintains the location of the Emergency Vehicle and the motorists. Once the server gets a request, it starts to look for motorists around the coverage area, using a simple circle coverage algorithm to send alerts to the people. We have to write a code that detects motorists within the perimeter.

We can also make use of the direction sensor to alert about the direction from which the Emergency Vehicle is approaching. The server after processing decides to which group of people alert should be sent and sends the alert to all of them. So we need an active client here that is everyone should have an active internet connection and the application listens to get the alert.

1.3 The Alert Module

The Alert Module notifies the user about an approaching Emergency Vehicle. The alert can either be provided in a map, if the user is using a map for his travel, or we can have an audio notification, which will also be a good type of alert for majority of the people. This module has to keep listening to the server, for alerts. Then once alert is started, it is looped to a finite amount of time, as specified by the user at installation time.

1.4 Diagram



1.5 Survey

The previous projects done, in the area of Traffic Clearance for Emergency Vehicle was analyzed by us, and we found that these systems used transmitters and receivers to alert the motorists. This is a good way, but requires infrastructure in every vehicle. In this method, the alert was broadcast to all the people in the nearby location. This may lead to the confusion of on which side the Emergency Vehicle is approaching and may even lead to a jam.

Other forms of alert included Changing the Traffic Signal at intersections. This is a very good idea, but this also requires infrastructure and has to be implemented for each Traffic Signal Controller.

One more form of alert was by making use of a base station and alerting. All vehicles will be connected to the base station. The Emergency Vehicle sends an alert to the base station, and the base station will alert the people in the area. Again, infrastructure is a problem here.

Another self-survey that we took, revealed that driving the Emergency Vehicle is itself a stressful job and traffic jams adding to it makes things worse. Other findings were that the delay caused, because motorists did not note the emergency vehicle and too much traffic made their journey to be delayed by ten to fifteen minutes.

1.6 Software Specification

We use Android Studio for development of the mobile application. And a server side program, a Servlet has to be used for calculation of location and to send and receive requests. A local server such as Apache Tomcat can be used for testing.

1.7 Working

The Emergency Vehicle Driver switches on the Alert system in his Mobile Application with a single click. This will transmit the current location of the vehicle to the server. The server will readily accept the location as input. It will be simultaneously monitoring the motorist's location. The motorists, who are near the Emergency Vehicle can be

calculated with the help of location data. Then the alert is sent to motorist nearby. So the motorists can give way before the Emergency Vehicle arrives.

2. CONCLUSION

This is our contribution to the society, which makes life better for Emergency Vehicle Drivers, and to save more lives. With the advent of increasing vehicles and traffic, our proposal can be applied to have better response to Emergency Vehicles.

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