TECHNO INTERNATIONAL NEW TOWN

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Department of Computer Science & Engineering

Seventh Semester Project-II Report (PROJ-CS781)

Provision of Efficient Routing and Green Corridor for Emergency Vehicles via Traffic Congestion Detection using IoT.

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Place: Techno International New Town

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Approval

This is to certify that the project report entitled "**Provision of Efficient Routing and Green Corridor for Emergency Vehicles via Traffic Congestion Detection using IoT**" prepared under my supervision by **Ankita Majumder (18700120175), Nilanjana Saha (18700119103), Aashish Raj (18700119100), Subhadeep Dhar (Roll - 18700119096),** be accepted in partial fulfillment for the degree of Bachelor of Technology in Computer Science & Engineering which is affiliated to Maulana Abul Kalam Azad University of Technology, West Bengal (Formerly known as West Bengal University of Technology).

It is to be understood that by this approval, the undersigned does not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn thereof, but approves the report only for the purpose for which it has been submitted.

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Abstract

Traffic congestion is one of the major issues with the public transportation system in recent times. This results in a huge amount of accidents every day and emergency vehicles like an ambulance often fail to serve critical patients when stuck in congestion. Real-time traffic monitoring systems play an important role in the development of smart cities. More efficient and intelligent transportation systems and a significant amount of research work is carried out on traffic management systems, but intelligent traffic monitoring is still an active research topic due to the emerging technologies such as the Internet of Things (IoT) and Artificial Intelligence (AI). This paper proposes a model using Internet of Things, which detects the traffic congestion on the road and transfers this information to the ambulance driver 3-4 kms ahead of the congested area through a mobile app to take another route and provide a green corridor.

CONTENTS

1. Introduction

Traffic monitoring is an inherent part of an intelligent traffic management system. Therefore, developing countries are implementing IoT in their cities to minimize traffic-related issues. Traffic congestion occurs when the number of vehicles on the road is greater than the capacity of the road. There is an increase in passenger vehicle registration in Delhi by 9.23% in April-March 2017 as compared to the same period in the previous year. freight volume in India is increasing at an alarming rate of 9.08% and that of vehicles at 10.76% whereas that of road by 4.01%. The existing system requires more manpower, it can not detect traffic congestion, and it can not be remotely controlled. There are various techniques and hardware methods existing for traffic surveillance systems to address the above mentioned issue but this paper proposes a cost effective internet-of-things (IoT) based intelligent traffic congestion detection system.

The Internet of Things (IoT) is a network of web-enabled devices capable of sending, receiving, and acting on the data they acquire from the physical world using sensors, processors and other hardware devices of the embedded systems. These devices are even capable of taking minute decisions from the collected data without human assistance. Traffic congestion monitoring solutions use IoT enabled sensors or drivers' mobile phones to monitor, track, and predict traffic patterns, in order to provide visibility into traffic congestion and trends. Traffic surveillance refers to monitoring the day to day ongoing road activities to provide better road facilities. It utilises information gathered from different areas to prevent certain scenarios. Emergency vehicles like Ambulance and Fire engines need to be on time to prevent loss of human life. Thus, helping an emergency vehicle to move out of traffic congestion is very much essential in the current traffic scenario. Therefore, intelligent traffic management has evolved as a compulsory requirement for proper civilisation. The problem of urban traffic congestion is spreading constantly. The increase in traffic is due to the growing population and number of vehicles. Due to an increase in population and the increased use of automobiles it has become a huge challenge for emergency vehicles like an ambulance to pass through in emergency situations.

According to a report by National Institute of Emergency Medicine (NIEM), 20% of the people lost their lives for lack of timely treatment due to traffic jams. As per the data shared by Management of Acute Coronary Event (MACE) Registry of the Indian Council of Medical Research (ICMR) more than 50% of heart attack cases are unable to reach the hospital on time. These facts signify the need for traffic regulation that enables Emergency Vehicles (EV) to reach their destination on time.
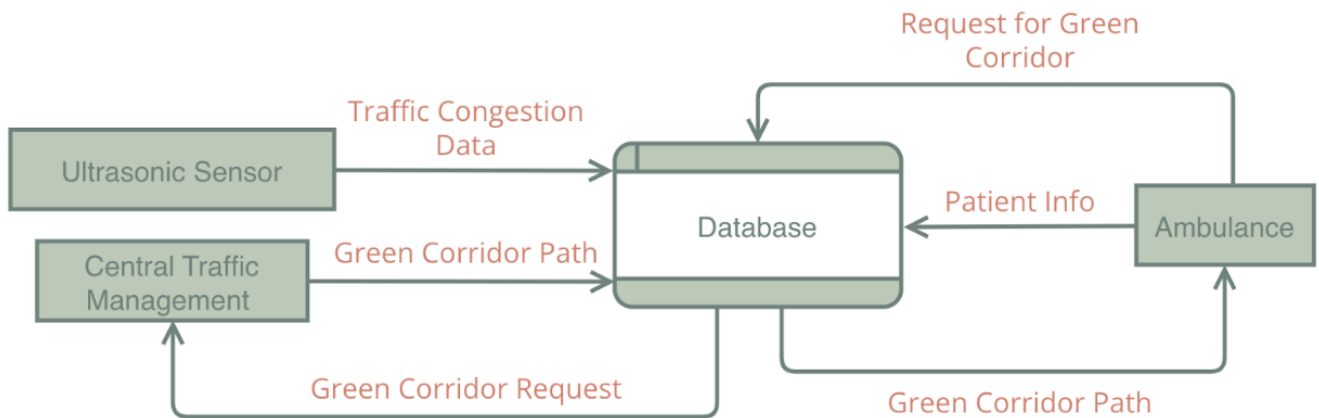
2. Problem Definition

Emergency vehicles demand quick and safe passage which is growing relatively hard due to poor traffic management. Implementation of expensive traffic congestion detection systems in a developing country like India is challenging. Therefore, A cost effective traffic congestion detection model is proposed that will detect and find the best route for emergency vehicles.
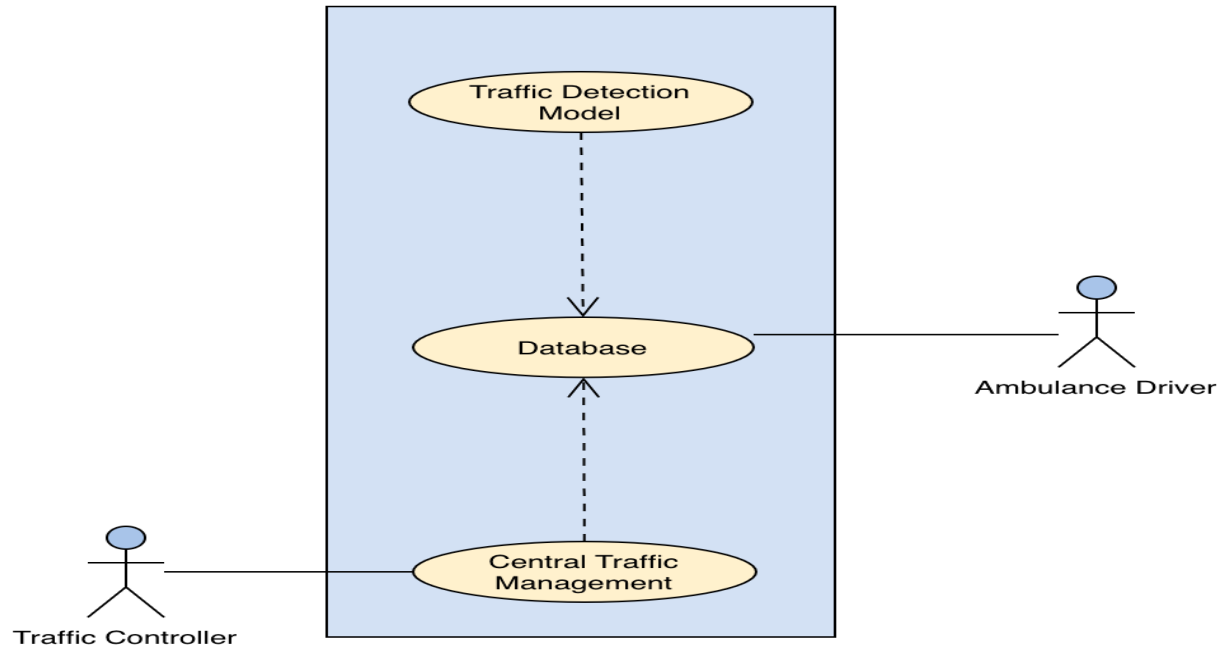
1. Data Flow Diagrams(DFD)
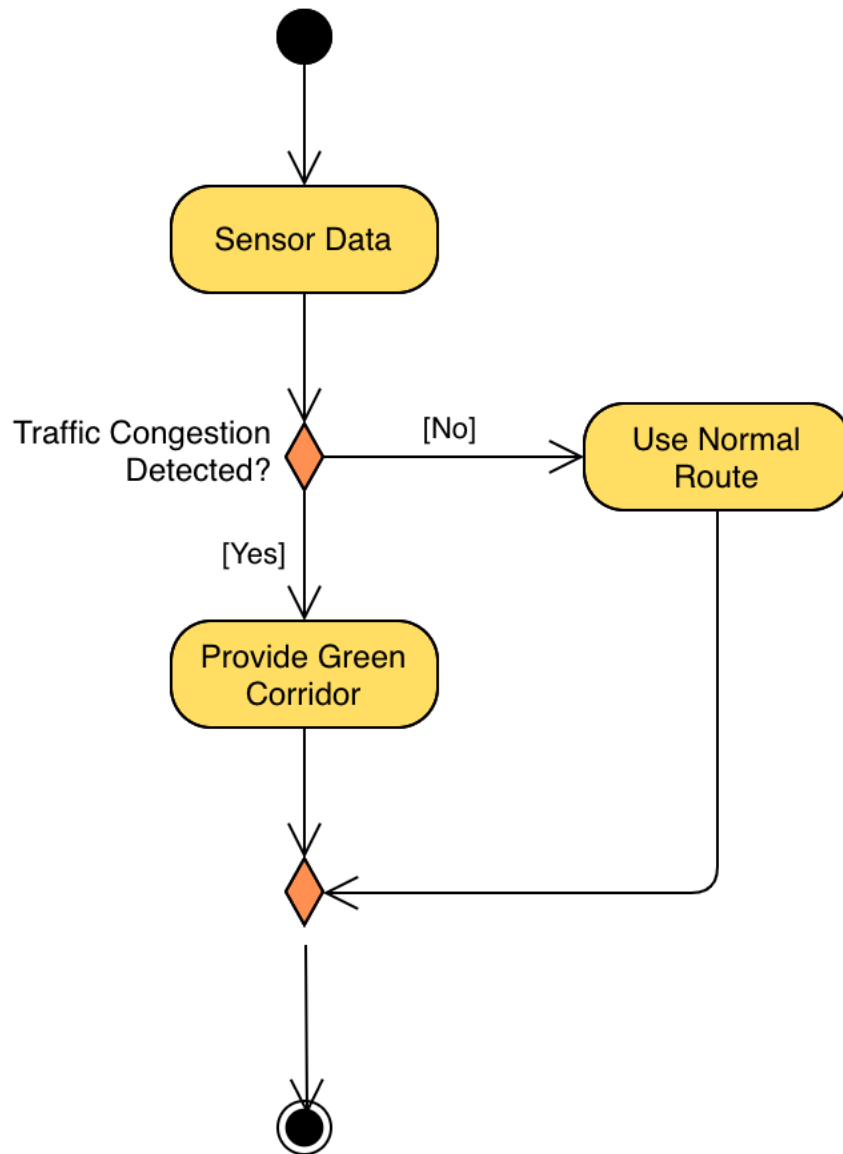
1.1. Context Level Diagram

Traffic Detection Model

Database

Ambulance

1.2. First Level DFD

Ultrasonic Sensor

Traffic Congestion Data

Central Traffic Management

Green Corridor Path

Database

Request for Green Corridor

Patient Info

Ambulance
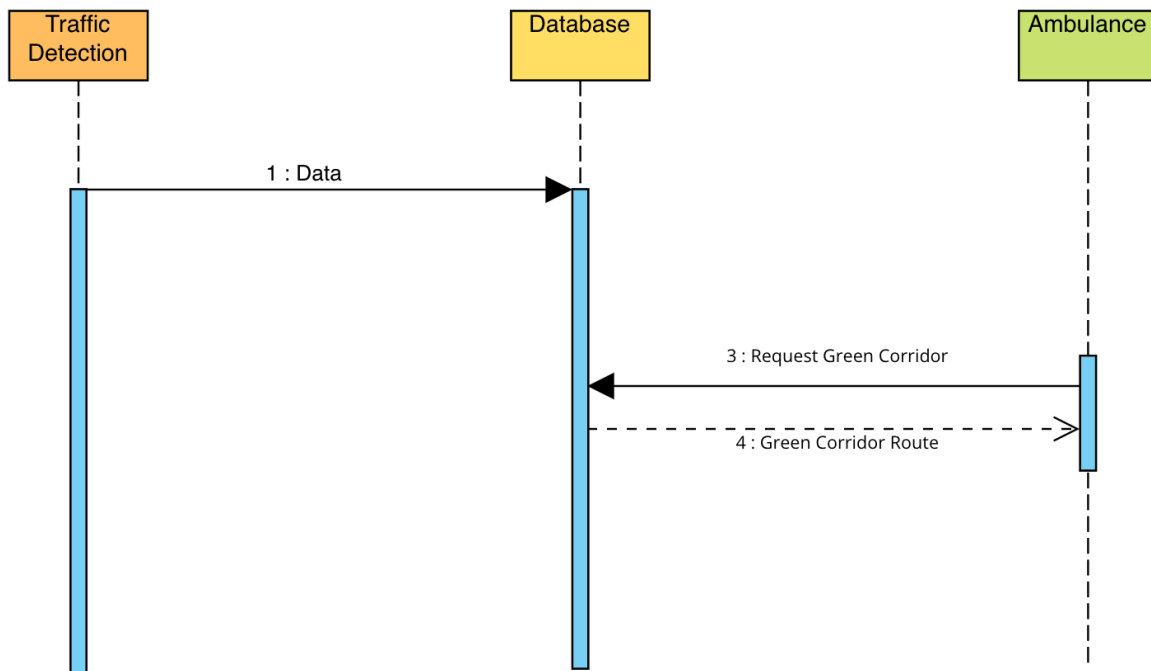
Green Corridor Request

Green Corridor Path

2. Use Case Diagram

3. Activity Diagram

4. Sequence Diagram

5. Future Scope of the Project

Going forward we intend on starting work on the project by making a working model for the congestion detection and an application that would showcase the user interface that would be used for location input.

6. Conclusion

One of the major issues with the public transportation system in recent times is traffic congestion. Also, the number of deaths due to delay in the arrival of emergency vehicles have increased to a greater extent in recent times. Emergency vehicle ambulances need to be on time to prevent loss of human life. Thus, helping an emergency vehicle to move out of traffic congestion is very much essential in the current traffic scenario. Our proposed system targets this exact problem and aims to reduce transport time thus reducing the chances of exacerbating a patient's issue or even preventing death due to delay in transit. Our application will merge existing services and research to create a system that will provide the quickest route and a green corridor on said route.

In future enhancement, the alternative route can be shown to reach the nearby hospital avoiding the traffic signal. The hospital nearest to the ambulance can receive patient details and status of health condition so that the hospital would be ready to treat the patient by the time the ambulance reaches that hospital.

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