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Congestion Control for Medical Emergency with Vehicle-to-Vehicle Communication Using IoT

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Abstract: Traffic is a huge trouble which takes place after an accident. Vehicles in the accident area get congested, moreover without knowing about the accident, vehicles coming from the other roads make the situation difficult for the ambulance to travel and reach the nearest hospital on time. So keeping those problems in mind, an approach that will be able to avoid series of collision and also can control traffic jam using vehicle to vehicle communication.

I. INTRODUCTION

Nowadays, number of cars are increasing on road immeasurably. As a results road accident and traffic jam is a growing problem. Hence, research to improve road safety application is a subject of immense concentration. By communication through wireless networks, safety application can be use to avoid accident. In this field, vehicular ad-hoc networks (VANETs) play the significant role. This network also connects large areas through basic mobile station and internet. A group of moving vehicles is comprehensively capable of communicating with each other using VANETs.

II. RELATED WORK

A. Purpose of the document

This paper is the Software Requirement Specification (SRS) for the Congestion control for medical emergency vehicle-to-vehicle communicating using IOT. The purpose of this paper is to describe the functionality, requirements and general interface of our project.

B. Scope for development of this paper

To reduce or completely eliminate the need of traffic monitoring system at junctions in both heavily populated cities and smaller towns as they are often mismanaged and do not adapt to the various traffic conditions automatically

III. EXISTING SYSTEM

A. Most of the vehicle collision avoidance systems developed is based on ITS concept.
B. Vehicular networking can be evaluated using safety metrics in terms of traffic safety.
C. So proposed evaluation scheme will quantify the probability of a crash by continuously monitoring and transmitting the beacon message to the possibly colliding vehicles.

IV. PROPOSED SYSTEM

A. This project aims to reduce or completely eliminate the need of traffic signals at junctions in both heavily populated cities and smaller towns as they are often mismanaged and do not adapt to the various traffic conditions automatically.
B. It is manually controlled it is not guaranteed that the controller is controlling it in the most efficient way. This system will automate traffic management at junctions based on the location.

V. REQUIREMENTS AND SPECIFIACTIONS

A. Functional Requirements

1) System should automatically sense vehicles approaching near hub.
2) System should automatically calculate the speed of vehicle approaching hub.
3) System should automatically communicate with vehicles to avoid collision.
4) System should automatically detect ambulance and prioritize it.

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B. Non-Functional Requirements

1) *Reliability:* The capability to maintain the specified level of performance is called reliability. Unauthorized person will not be able to access the details.
2) *Availability:* The system must work relatively fast and must provide the data on request as soon as possible without affecting the quality and accuracy.
3) *Security:* This system must be highly secured and must authenticate users strictly. This system would require handling confidential data. This system must keep the documents with more security as they will be stored in private account.
4) *Maintainability:* Maintenance and the system monitoring should be simple and objective in its approach
5) *Flexibility:* The system should be flexible enough to allow modifications at any point of time.

C. Minimum Hardware Requirements

1) ARM LPC2148
2) ZIGBEE
3) POWER SUPPLY DESIGN
4) ULTRASONIC SENSOR
5) IR SENSORS
6) LCD DISPLAY

D. Software Requirements

1) Kiel M vision
2) Embedded c
3) Arduino IDE

VI. SYSTEM DESIGN USECASE DIAGRAM

A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well. While a use case itself might drill into a lot of detail about every possibility.

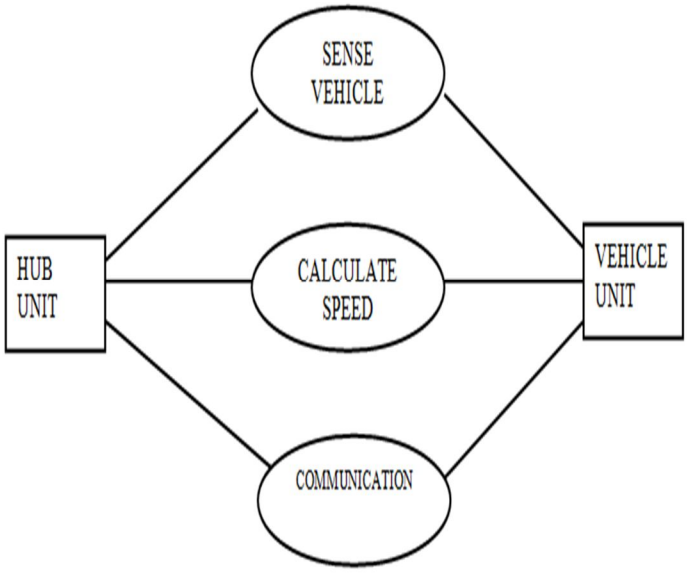


Fig 1: Use case diagram

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VII. ACTIVITY DIAGRAM

The activity diagram is an UML diagram that describes the system's dynamic aspects. In fact, it is a flowchart that regulates the flow every event. The event can be described as the operation of the system. The control flow shall be taken between operations.

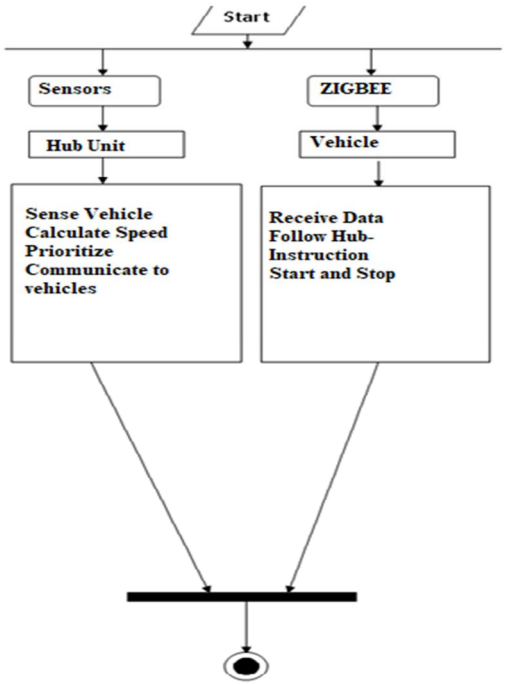


Fig 2: Activity diagram

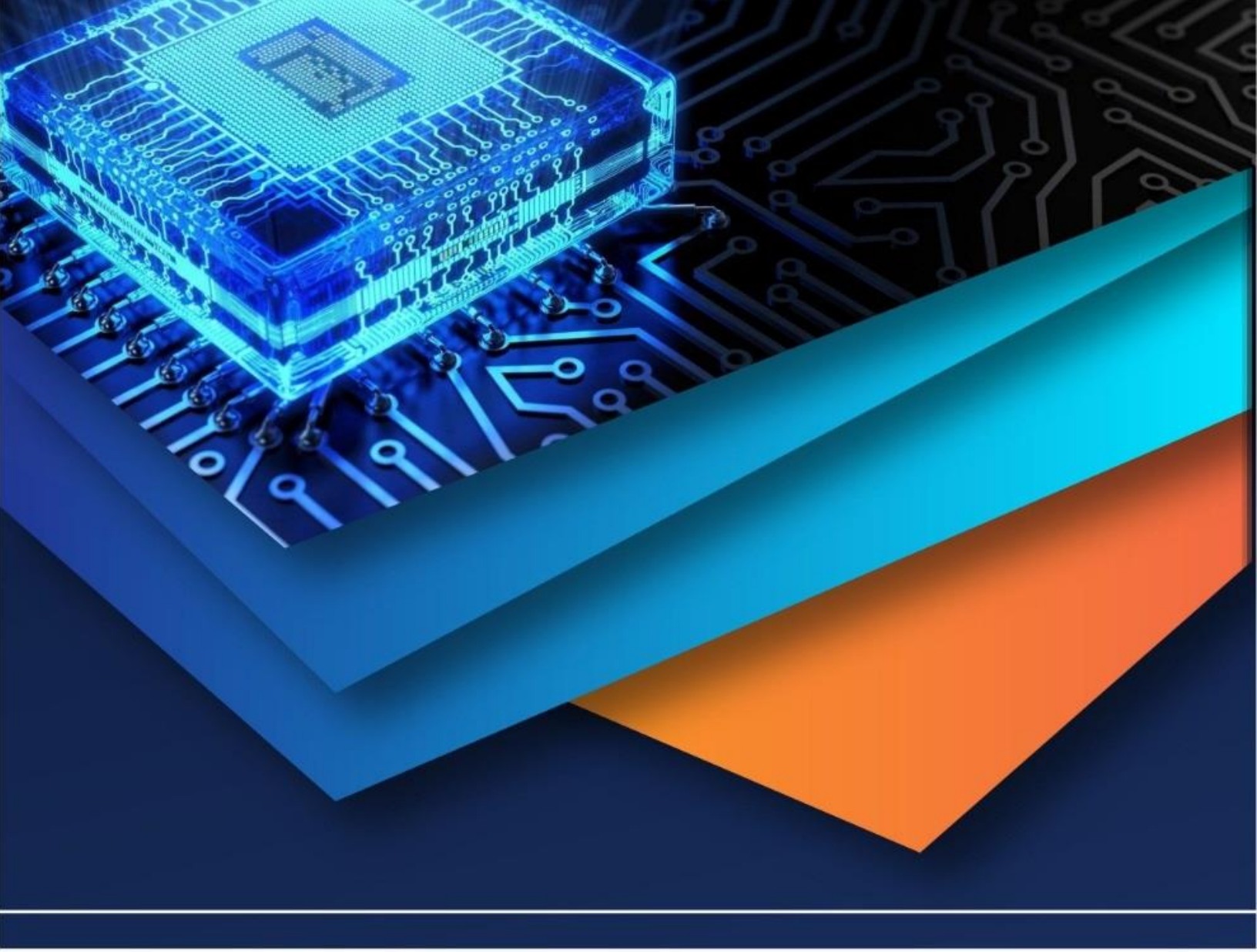
VIII. CONCLUSION

An efficient solution to accident avoidance and congestion control on road in city environment. In this proposed approach, before receiving any message each vehicle checks whether the message already has been received, So the process is capable of avoiding message duplication that helps to reduce network overhead.

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