An Overview and Application of IOT in Emergency Smart Ambulance Services Integrated With Traffic Monitoring System

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ABSTRACT - Internet of Things(IoT) is the modern advancement made with internet by connecting all the things around the world. With IoT we can build many systems by which we can automate all the things around us. IoT has made several developments and contributed to a greater number of useful systems and electronic devices in the fields of Manufacturing Industries, Agriculture, Education, Healthcare etc. We will briefly discuss about one of the futuristic systems under development. The system is known as Emergency Smart Ambulance Services integrated with Traffic Light Systems. This system is simply an emergency guide to Ambulances and the traffic light systems to avoid traffic congestion before and after the passing of ambulance through the traffic signal. In this system, we make use of Micro-processors, GPS systems and RF Modules and the entire system will be programmed and configures using special IDEs. Let us look into each individual functioning blocks and the discuss the effectiveness of this system.

I. INTRODUCTION

The Internet of Things (IoT) is a modern paradigm that connects all the Electronic Devices, Sensors, machines, etc., to the internet which helps for the facilitation of Human Life. In simple IoT is a system that connects all the living and non-living things to Internet with the help of electronic devices. This system enables the Humans to open the gates of Future Universe in which all the objects in this world will be connected through internet. The major application of IoTs are Home Facilitation with smart Home appliances, Health care electronic devices like heart rate monitoring sensors & biosensors and industrial automation along with AI powered robots.

II. EMERGENCY SMART AMBULANCE SERVICES

Emergency Smart Ambulance Services (ESAS)is simply a system which connects all the vehicles and ambulances to a cloud system. All these Ambulances will have a GPS system coupled with RF Transmitter and Micro-Controllerwhich enables this system to find the location of the accident spot and the system helps to locate the nearest ambulance from the accident spot. The microcontroller will be connected to Internet with an LTE supported network. Once the nearest ambulance is located, the ESAS system will guide the ambulance to the accident spot through the shortest route. Once the ambulance reaches the spot, the system turns on the RF Transmitter present in RF Module installed in the Ambulance. Then the injured patient will be supported with electronic devices which as well can monitor and support the life of the injured.

GPS TRACKER

AMBULANCE

MICRO CONTROLLER

RF MODULE
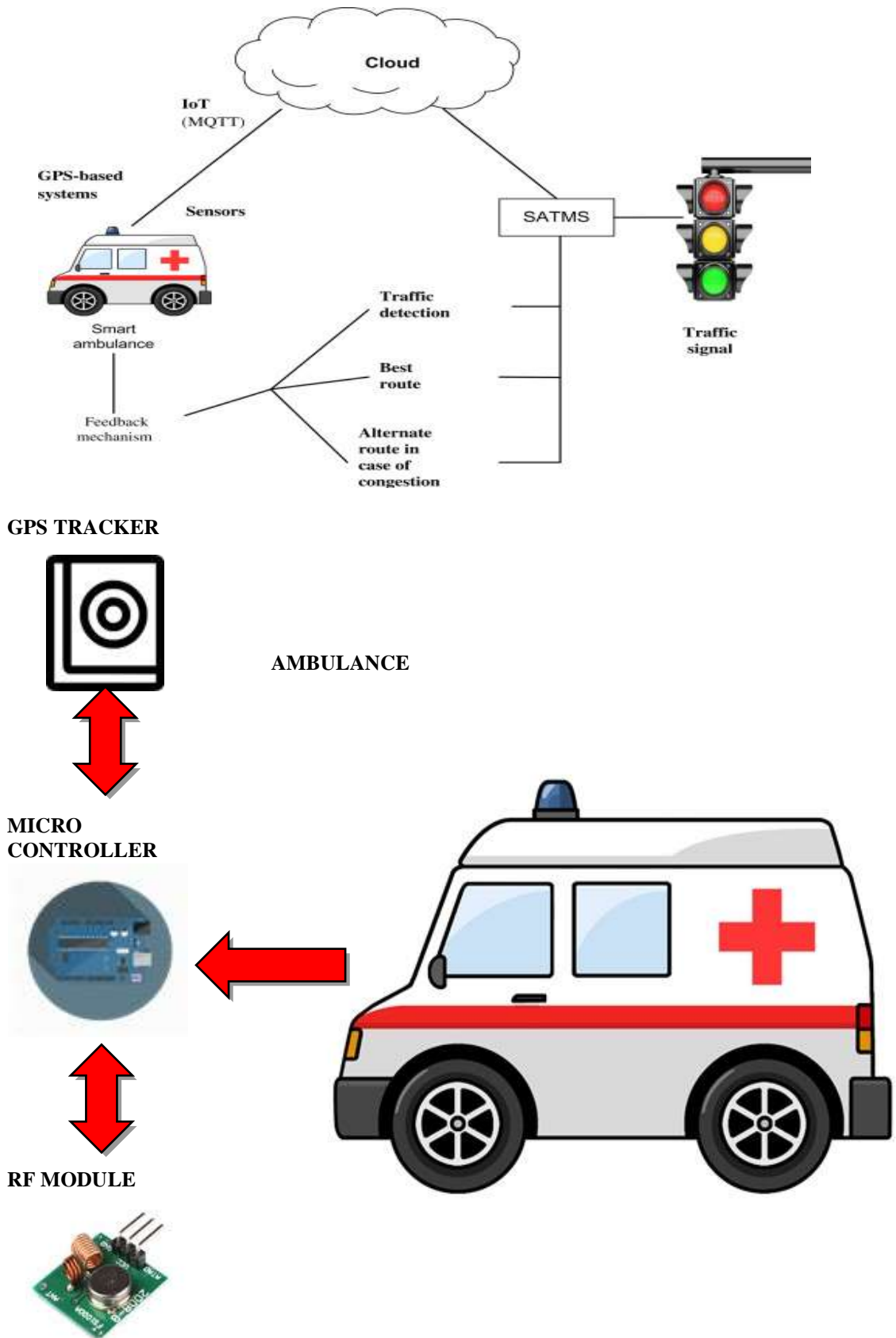
tation of the patient, the Micro-controller present in the ambulance will

continue to send the location details as well as the medical conditions of the patient to the cloud which

will help the system to identify the severity of the injury and the nearest hospital to seek immediate treatment. After analyzing all the data, the system will send the nearest Hospital details to the ambulance. Also, the RF Transmitter will send its radio frequencies which will be integrated with Traffic Light Systems to ensure no traffic in the rout of the ambulance.

III.   TRAFFIC LIGHT SYSTEMS FOR ESAS

MICRO-
CONTROLLER   RF MODULE
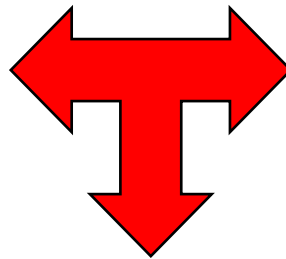
TRAFFIC LIGHT SYSTEMS
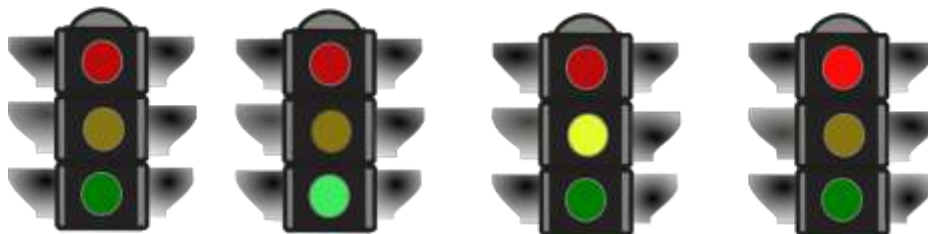
As the ambulance continues to send the Radio Frequencies, those frequencies can be identified by the Traffic Light System. As soon the frequencies are received by the system, it begins to alter the Lights so that the Route by which the ambulance is designated to transport will be set open. As soon as, the Ambulance crosses the Traffic Light, the Traffic Light Systems retracts to its default functionalities.

IV.   ELECTRONIC COMPONENTS REQUIRED

The two major electronic components that integrate Emergency Smart Ambulance Service System and Traffic Light System are Micro-controller and RF Module.

To ensure faster transportation of the injured patient, all the Traffic Light Systems may be connected to ESAS system and they are installed with RF Receivers &Microcontrollers to Control the Traffic Lights. When the ambulance is routed to a hospital, then the same details can also be sent to all the Traffic Light Systems installed in the route of the ambulance. Once the details are received by the Traffic Light Systems, it turns on the RF Receiver installed in the Traffic Light System.

A Micro-controller is an embedded system which controls a specific machine or a device to which it has been connected and programmed to do the functions to the device. It is a single chip which has all the necessary peripherals like CPU, RAM, ROM etc., and it can be programmed with the respective compatible Interfaces. Most widely used micro-controller in ESAS and Traffic Light Systems is Arduino which can be programmed using Arduino IDE.

A RF Module is nothing but a combination of Radio Frequency transmitter and Receiver. These combination works on a specific frequency which can send and receive such frequencies through RF antenna present in the RF Module. These RF modules have much potential as

these were found to be better than Infrared Wave Transmissions and also power efficient.

V. FUNCTIONING AND EFFECTIVENESS OF THIS SYSTEM

This type of systems mainly relies on Electronic Devices of best quality and Stable Network Connections around the areas where ambulances have to travel. When we achieve the required quality of network and electronics, we can use this system effectively which can help the mankind to save lives.

The functioning of this system also requires skilled ambulance drivers that they must be aware of this system and have the ability to make use of all the features that are present in the system.

When all the requirements are fulfilled, the system will become the most eminent life saving option for the mankind. Whenever, an accident occurs it will be reported and as soon as the accident is reported, the nearest ambulance will be allocated and sent to save the lives. Once ambulances pick up the injured patients, then the Traffic Light System comes into action to save the time and traffic congestion at traffic signals. And also, the usage of additional IoT devices like Smart Healthcare devices which will add the chance of diagnosing and analyzing the conditions of the injured which in parallel enables the Doctors to monitor the conditions and arrange immediate medical treatment to the patient. Summing up all the elements, undoubtedly this system will serve as a life-saving option developed using IoT.

As on date, our world does not meet the requirements to fulfil the needs of the system. Hence at present, this type of system may be an unimplemented idea. But definitely in future it will rise the quality of life saving systems and ideologies.

VI. CONCLUSION

The hardware components are successfully assembled and interfacing the micro controller with GPS system and RF module is achieved. Hence the module of emergency traffic monitoring system is successfully tested and demonstrated. This is because the automation has become the basic requirement in almost every aspect of technology.

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