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# 10 COMPLETE SPECIFICATION

(See Section 10; rule 13)

TITLE OF THE INVENTION

# 15 IoT Traffic Control for Emergency Detection

APPLICANT

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| --- | --- | --- |
| **S. No** | **Applicant Name** | **Address** |
| **1.** | K.RAMAKRISHNAN  COLLEGE OF TECHNOLOGY | The Principal, K.Ramakrishnan College of  Technology, Kariyamanickam Road, Samayapuram, Trichy, Tamil Nadu, India- 621112 |

20

The following specification particularly describes the invention and the manner in which it is to be performed.

**IoT Traffic Control for Emergency Detection**

**Student Name: Avinash P**

**Logeswaran B**

**Issac Hudson S**

**Hariharan U**

**Mentor Name: Dr.S.Manikandan**

# IoT Traffic Control for Emergency Detection

# TECHNICAL FIELD

# The technical field of this invention relates to intelligent traffic management systems, for the real-time detection of emergency vehicles such as ambulances at traffic signals. The system integrates GPS and IoT technologies to adjust traffic signal within a certain radius, ensuring the safe passage of emergency vehicles through the traffic congestion.

# BACKGROUND

1. In emergencies, every second, especially when an ambulance is on its way to help someone in need. Unfortunately, traffic congestion can slow down ambulances, making it harder for them to reach the patient or hospital in time. This delay can be critical, as it may affect the chances of saving a life.
2. To solve this problem, a special device can be installed in ambulances. This device uses advanced technology to communicate with traffic signals. It includes important components like a microcontroller, GPS, RFID/Beacon, and a communication module. Together, these parts help the ambulance send messages to nearby traffic lights.
3. When the ambulance is close to a traffic signal, the device automatically sends its location and a priority alert. This tells the traffic lights to change in favor of the ambulance, usually by turning green, so it can pass through without stopping. This way, the ambulance can move faster and more safely through busy streets.
4. By using this IoT device, emergency response times can be improved significantly. It helps ambulances reach their destinations quicker by reducing the time spent in traffic. This simple but effective solution makes emergency services more efficient and saves lives.

# OBJECT OF THE INVENTION

1. The primary object of the present invention is to provide an IoT-based ambulance detection system to ensure efficient and timely passage through traffic.
2. Another object of the present invention is to eliminate the mechanical break downs.
3. Another object of the present invention is to automatically adjust traffic signal timings to prioritize emergency vehicles.
4. Yet another object of the present invention is to improve the safety and reliability of emergency response operations.

**SUMMARY**

[0009]This invention focuses on developing an IoT-based system to improve the efficiency and safety of ambulance transportation through traffic. The system automatically detects ambulances as they approach traffic signals and adjusts the lights to green, ensuring that the ambulance can pass through intersections without delay. This reduces the time lost in traffic jams, which is crucial in emergency situations where every second counts. The system is designed to operate without the risk of mechanical breakdowns, as it relies on digital communication rather than physical components. By streamlining traffic for ambulances, the system also reduces the overall energy consumption of traffic management.

[0010] Additionally, the technology enhances the reliability of emergency responses, minimizing the risk of accidents during high-speed travel. It ensures that ambulances reach their destinations as quickly and safely as possible, ultimately improving the effectiveness of emergency medical services. This invention, therefore, contributes to saving lives by ensuring timely medical assistance.

[0011] The IoT-based ambulance detection system, in another version, includes RFID/Beacon devices that talk directly to traffic lights, making sure they change to green when the ambulance gets close.

[0012] The IoT-based ambulance detection system, in another version, uses a GSM/GPRS module to connect with the main traffic control center, helping to change signals at several intersections so the ambulance can move through traffic smoothly.

[0013] The IoT-based ambulance detection system, in another version, has an energy-efficient power system, ensuring the device keeps working during long emergency drives.

[0014] The IoT-based ambulance detection system, in another version, includes a small OLED screen that shows real-time updates, allowing emergency workers to check that the system is working properly during urgent situations.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0015] Fig 1 illustrates the block diagram of the IoT-based ambulance detection system, according to an embodiment of the present invention.

[0016] Fig 2 illustrates the flowchart showing the communication process between the ambulance and traffic signals, according to an embodiment of the present invention.

[0017] Although the specific features of the present invention are shown in some drawings and not in others, this is done for convenience only as each feature may be combined with any or all of the other features in accordance with the present invention.

# DETAILED DESCRIPTION

[0018] This invention is about a smart system that helps ambulances move quickly through traffic. It uses special devices to communicate with traffic lights and other systems, making sure the ambulance gets a clear path when it’s in a hurry.

[0019] When someone is in need of urgent medical care, every second counts. Ambulances often get stuck in traffic, which can delay them from reaching the hospital on time. This system is designed to solve that problem by clearing the way for ambulances.

[0020] The system is installed in ambulances and connects with traffic signals and a central traffic control server. It sends signals to change the traffic lights to green, allowing the ambulance to pass through intersections without stopping.

[0021] One of the key parts of this system is the GPS module. It tracks the exact location of the ambulance using satellites. This information is then used to determine which traffic lights need to be adjusted.

[0022] The microcontroller acts like the brain of the system. It receives information from the GPS module and other sensors, processes it, and sends out commands to different parts of the system to make sure everything works together smoothly.

[0023] The RFID/Beacon module is responsible for short-range communication with nearby traffic lights. When the ambulance gets close to a traffic light, this module sends a signal to the light, telling it to turn green.

[0024] The GSM/GPRS module allows the system to communicate with the central traffic server. This means the ambulance can send and receive information even from far away, helping to control traffic lights at multiple intersections.

[0025] When the system sends a signal to a traffic light, the light changes to green for the ambulance. This ensures that the ambulance doesn’t have to stop at red lights, allowing it to reach its destination faster.

[0026]The central traffic server is a powerful computer that manages traffic signals in different areas. It receives information from the ambulance and makes sure that traffic lights along the route are adjusted in advance.

[0027]The system has a power supply that keeps all the devices in the ambulance running. This is important because the system needs to work continuously during the entire emergency trip.

[0028]Inside the ambulance, there is an OLED display that shows important information to the ambulance crew. This includes the status of the system and any alerts, so they know everything is working properly.

[0029]One of the best features of this system is that it works automatically. The ambulance driver doesn’t have to do anything special to make the system work. As soon as the ambulance is on the road..

[0030]This system greatly benefits emergency services by reducing the time it takes for ambulances to get through traffic. Faster response times can make a big difference in saving lives.The system is designed to use energy efficiently. This means it doesn’t waste power, which is important for long emergency trips where the system needs to keep working without interruption.

[0031]Safety is a key consideration in this system. By clearing the way for ambulances, it reduces the chances of accidents happening at intersections, making the roads safer for everyone.

[0032]The system is built to be reliable, ensuring that it will work correctly every time it is needed. This reliability is crucial during emergencies, where there is no room for errors or failures.

[0033]The system is designed to work with existing traffic lights and control systems. This means it can be easily integrated into current traffic management setups without needing major changes.This technology could be expanded in the future to work with other emergency vehicles, like fire trucks and police cars. This would further improve the efficiency and safety of emergency services.

[0034]Unlike traditional systems that require manual control or do not prioritize ambulances, this IoT-based system is fully automated and specifically designed to ensure that ambulances can get through traffic quickly.

[0035]In conclusion, this IoT-based ambulance detection system is a smart, reliable, and efficient way to help ambulances move through traffic quickly and safely. It is a valuable tool for improving emergency response times and saving lives.

# CLAIMS

**We Claim,**

1. **An IoT-based system for ambulance detection and traffic signal control, comprising:**

A GPS module to continuously track the real-time location of the ambulance;

A microcontroller configured to process location data and control communication between the system components;

An RFID/Beacon module to communicate with nearby traffic lights, triggering automatic signal adjustments;

A GSM/GPRS module for sending and receiving data between the ambulance and a central traffic control server;

A power supply to ensure continuous operation of the system during emergency situations;

1. The system as claimed in claim 1, where in the RFID/Beacon module triggers a traffic signal to turn green as the ambulance approaches an intersection.

2. The system as claimed in claim 1, where in the GSM/GPRS module allows for communication with multiple traffic signals along the ambulance’s route, enabling synchronized signal changes.

3. The system as claimed in claim 1, further comprising an OLED display that provides real-time status updates to the ambulance crew, ensuring optimal system functionality.

4. The system as claimed in claim 1, wherein the power supply is designed to be energy-efficient, allowing the system to operate for extended periods without interruption.

5. The system as claimed in claim 1, wherein the microcontroller coordinates the operation of the GPS, RFID/Beacon, and GSM/GPRS modules to optimize the ambulance’s route through traffic.

# ABSTRACT

# IoT Traffic Control for Emergency Detection

This invention is about a smart system that helps ambulances get through traffic quickly and safely. The system includes a GPS device to track the ambulance’s location, a microcontroller to manage the system, an RFID/Beacon module to talk to traffic lights nearby, and a GSM/GPRS module to connect with a central traffic control system. When an ambulance is on the way, the system automatically changes traffic lights to green, allowing the am

bulance to move without stopping. It also has a small screen inside the

ambulance to show real-time updates to the crew. The system is energy-efficient, works with current traffic lights, and helps ambulances reach their destination faster in emergencies.