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A mobile ZigBee module in a traffic control system

Abstract:

Time is of the essence when ambulances are utilized to save people's lives, but when an ambulance needs to pass through a junction, its speed often must be reduced due to traffic. This complicates situations when the patient in the ambulance needs urgent treatment that can be administered only at a hospital. Due to the unavailability of advanced medical procedures in an ambulance, there is the possibility for patients to suffer a loss of life. Traffic control is a challenging issue in the urban cities of India, as is the case in much of the rest of the world. ZigBee technology is a wireless standard designed to operate low-power wireless sensor networks, and it can aid emergency vehicles in dealing with traffic congestion.

Existing system:

Whenever fatalities or accidents occur due to any kind of transport problem or natural calamities, the most convenient way to carry the victims to nearby hospitals is through an ambulance. Some of the traffic control system models are fixed in nature. If the sensors have to be fixed on the roadside, it increases the cost of implementation. As in "Bus priority control system based on wireless sensor network (WSN) and Zigbee," the bus is equipped with an on-board node that sends





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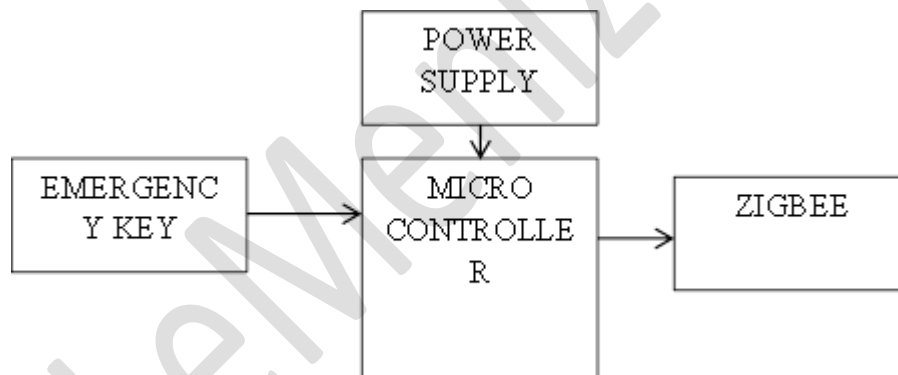
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information regarding the traffic conditions along its entire route, including to the roadside fixed-sensor nodes and the intersection nodes.

Disadvantage:

- This means that all of the nodes must be working all of the time. Even though the ZigBee model comes with the advantage of using low power, it is underutilized.

Block Diagram:





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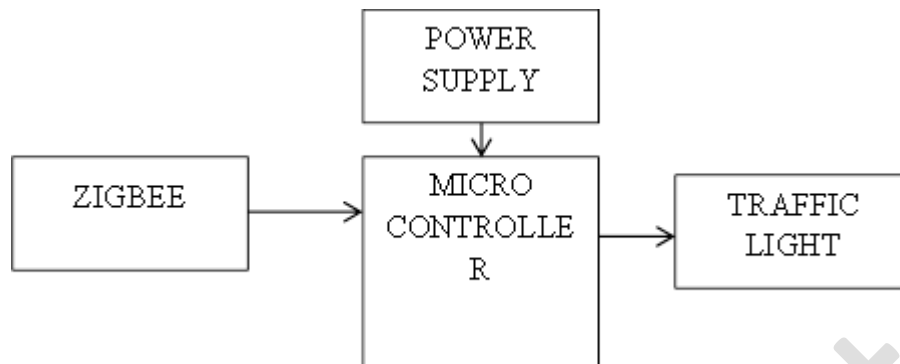
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Proposed system:

It can be concluded that almost all fixed roadside sensors face problems. To overcome this, we propose the mobile ZigBee module in a traffic control system, which gives way for the ambulance at traffic junctions without any problems. In this article, there are mainly two parts. The first part describes the ZigBee transmitter that is placed in the ambulance, and the second part details the ZigBee receiver implemented at the traffic pole. In the first part of the proposed model, the ZigBee transmitter is switched on only by the driver, in case of emergencies. When the ZigBee transmitter is switched on, it begins sending signals to the nearest receivers, which are in the range of 100–200 m. whenever the ambulance comes in range, the signal is automatically turned to green so that vehicles that are ahead of the ambulance can pass through the signal, giving way to the ambulance. Soon after the ambulance passes through the traffic junction, the signal is turned back to





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its previous state. In the second part of the proposed model, the ZigBee receiver receives a signal from a transmitter, processes it, and converts the traffic signal to green so that the ambulance can pass.

Advantages:

- The transmission was successful at distances more than double than were specified.

Conclusion:

With the proposed model, we made sure that the ambulance has passed through the traffic junction without having to wait on its way to the hospital. This is done by turning the traffic signal to green. The system then turns the signal back to its previous state so that it does not cause traffic chaos. This proposed model is an efficient and a cost-effective solution for the problems faced by ambulances due to traffic jams at junctions. For an enhancement, we can install a global positioning system to monitor ambulance routes to find the shortest route to the nearest hospital.

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