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Ambulance Tracking And Traffic Management System Using RFID Tag

Shivani Buva[1], Vaishnavi Wadkar [2], Akanksha Salunkhe [3] , Sakshi Jadhav [4]

[1234]*Department of Computer Science and Engineering.*
[1234]*Dr.V.P.S.S.M's Padmabhooshan Vasantraodada Patil Institute of Technology , Budhgaon , Sangli , Maharashtra 416304.*

Abstract - *India faces road traffic congestion in crowded cities, most of deaths due to delayed ambulances. To address this issue, an Intelligent Traffic Signals Control System for Ambulance is proposed. This system uses RFID technologies to provide blue signals for ambulances, switching signals when they approach. The fully automated system recognizes ambulances and controls traffic signals, saving time during emergencies. This lifesaver project aims to reduce delays and improve ambulance movement in India, a rapidly growing economy.*

Key Words: **RFID tag , Ambulance , Tracking , Signals**

1.INTRODUCTION

The Ambulance Tracking System project is a groundbreaking initiative aiming to transform emergency medical services by addressing existing challenges. It aims to reduce response times, improve patient outcomes, and set new standards for technology integration. The project uses probability distributions and heuristic methods to solve problems, incorporating practical rules and techniques. It considers practicality, accessibility, and adaptability to ensure successful implementation and a positive impact on emergency medical services. The project is a trailblazer in integrating advanced technologies into critical healthcare infrastructure, making it a trailblazer in the integration of innovation into critical healthcare infrastructure.

1.1 PROPOSED WORK

The Intelligent Traffic Signals Control System for Ambulances is a proposed solution to delayed emergency response times in India. The system uses RFID technologies to provide priority blue signals for ambulances, dynamically switching traffic signals as they approach. The fully automated system is designed to recognize ambulances in real-time and control traffic signals accordingly, saving time during critical emergencies.

The project aims to improve ambulance movement in India's rapidly growing economy, reducing delays and enhancing the efficiency of emergency medical services. The Ambulance Tracking System project aims to set new standards for technology integration in emergency services, incorporating probability distributions and heuristic methods to address real-world problems. The project prioritizes practicality, accessibility, and adaptability, making it a trailblazer in the field.

1.2 Methodology

The methodology is a systematic approach to problem-solving and solution development. It involves a set of principles, guidelines, and techniques that guide the design process from problem definition to solution implementation. In the case of an ambulance tracking and traffic management system, it is crucial to follow a well-defined methodology.

This methodology includes System Requirements Analysis, where the goals and objectives are identified, functional requirements are defined, and non-functional requirements are determined. The use case modelling involves identifying actors involved in the system, such as ambulance drivers and dispatchers, and modelling various use cases. The architectural design involves designing the overall architecture, including components like ambulance tracking devices and traffic monitoring sensors. This process ensures the final system meets the required requirements and objectives.

In this project, we use an ESP 8266 IOT device for connection between Arduino and signals. It integrated wifi functionality which reduces the need for external components. Arduino in an ambulance tracking system can be part of a larger solution where the Arduino acts as a microcontroller to interface with various sensors, RFID readers, and other components. RC522 RFID tag and reader are used to track ambulances.

We also used 4 LEDs to represent the signal Red, Green, Yellow and Blue. The blue signal represents the emergency vehicle. It will indicate a blue signal approx 1.5 km before signal. The Arduino IDE is an open-source software tool used for writing, compiling, and uploading code to Arduino-compatible boards. It provides a user-friendly interface for programming Arduino microcontrollers.

2. FIGURES

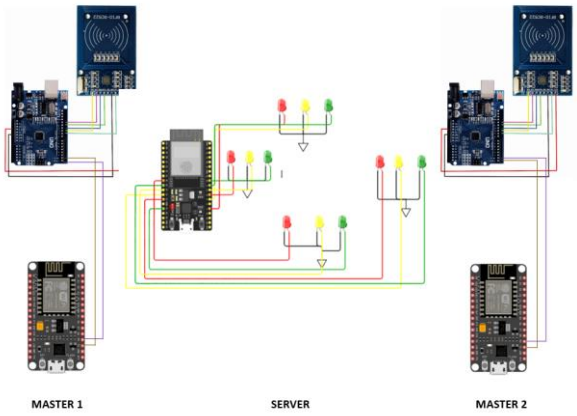

Fig -1: Circuit Diagram

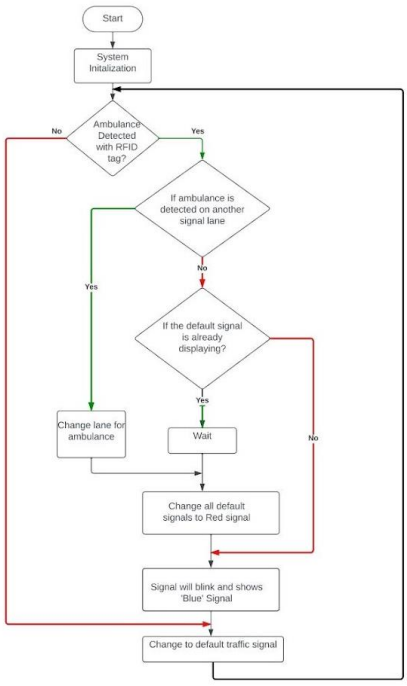

Fig -2: Flowchart

Flowchart contains following steps :

a. **System Start:** The traffic signal system begins operation and continuously monitors for RFID signals, which are used to identify emergency vehicles such as ambulances.

b. **Detect RFID Signal:** The system checks if an RFID tag that corresponds to an emergency vehicle (like an ambulance) is detected.

   i. If Yes: Proceed to the next step.

   ii. If No: Continue to monitor traffic normally.

c. **Ambulance Detected:** Once an ambulance is detected, the system identifies the lane in which the ambulance is currently traveling and also checks its direction.

d. **Change Traffic Signals:** The system changes the traffic lights in the path of the ambulance to red in all other directions except the lane where the ambulance is detected. This ensures all other traffic is halted, and the lane for the ambulance remains clear.

e. **Blinking Signal and Blue Sign:** To alert drivers to the emergency situation, the system can make the red signals blink and also display a Blue Signal . This signal can serve to alert drivers that an emergency vehicle is passing and extra caution is needed.

f. **Clear Path for Ambulance:** With the other signals turned to red and the ambulance's lane left as is (likely green or turning green), the ambulance can proceed without obstructions.

g. **Wait for Ambulance to Pass:** The system maintains the signal changes until the ambulance has passed through the intersection or cleared the signal zone.

h. **Reset Signals:** Once the ambulance has safely passed and is no longer in proximity to the traffic signals, the system resets all signals to their normal operation mode.

2.1 RESULTS

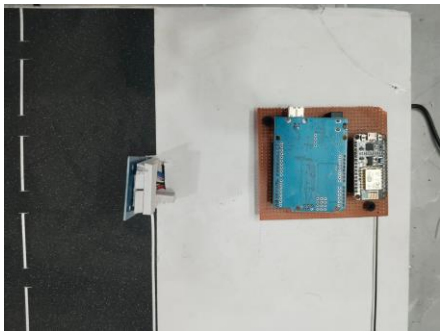

Fig -3: Controller 1

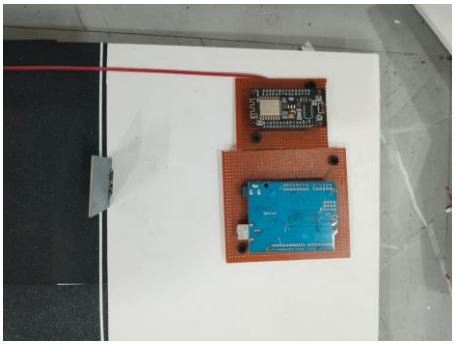

Fig -4: Controller 2

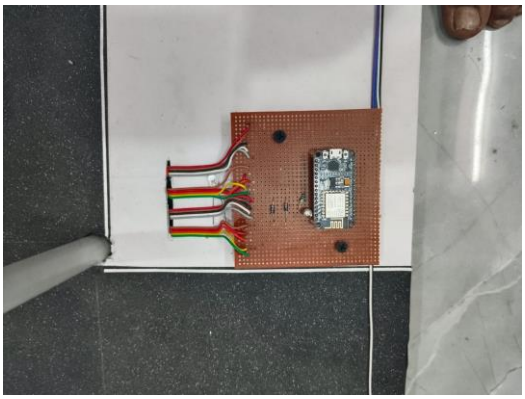

Fig -5: Master controller 2

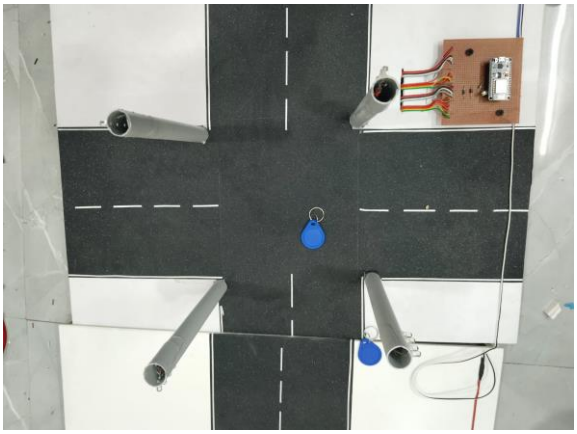

Fig -6: Model view

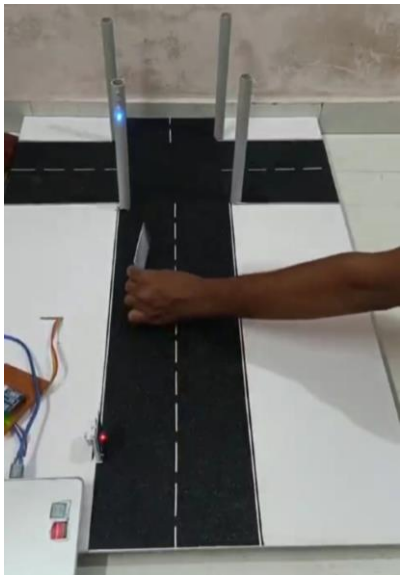

Fig -7: Working of project

3. CONCLUSIONS

In this world of busy roads, traffic signal plays the factor in saving person's life. In this project we are not only tried to provide a way to ambulance but also tried to provide a ready situation in hospital to do the treatment of patient in time. This system detects the occurrence of ambulance and switch the signals to blue . The entire system is automated, thus it require less human intervention. "Intelligent Traffic Signals Control System for Ambulance" increase the possibility of saving lives. In future we can do tracking and traffic management using Deploy traffic-monitoring drones with cameras for real time analysis. Guide ambulances based on aerial data, adapting to dynamic conditions and optimizing response. also satellite-based tracking to utilize satellite-based GPS in ambulances for tracking in remote areas. Independent, global coverage, overcoming terrestrial infrastructure limitations for improved emergency response.

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BIOGRAPHIES

Shivani Vijay Buva
Student
Padmabhooshan Vasantraodada Patil Institute of Technology,Sangli.
shivanibuva2003@gmail.com

Vaishnavi Sambhaji Wadkar
Student
Padmabhooshan Vasantraodada Patil Institute of Technology,Sangli.
vaishnaviwadkar4@gmail.com

Akanksha Mohan Salunkhe
Student
Padmabhooshan Vasantraodada Patil Institute of Technology, Sangli.
salunkheakanksha08@gmail.com

Sakshi Babasaheb Jadhav
Student
Padmabhooshan Vasantraodada Patil Institute of Technology,Sangli.
jadhavsakshi622@gmail.com