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# INTELLIGENT AMBULANCE

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*Abstract:* Ambulance response times are frequently significantly delayed in metropolitan settings due to heavy traffic and traffic accidents, which has a detrimental effect on patient outcomes during emergencies. In order to improve the efficacy and efficiency of emergency medical services, the Intelligent Ambulance system incorporates cutting-edge traffic management technology along with real-time health monitoring. The creation and implementation of an intelligent ambulance system that continuously monitors vital signs such blood oxygen levels, temperature, air pressure, and heart rate using MAX30100 and BMP180 sensors is presented in this study. Through a specialized app, these measurements are securely communicated to medical staff, enabling real-time patient assessment and readiness. The system uses RFID technology to manage traffic lights, allowing ambulances to travel through green corridors in order to reduce delays caused by traffic. In order to ensure quick and secure patient transport, the ambulance driver app offers real-time traffic information and optimized navigation routes. The findings show that critical patients have higher survival rates and shorter average reaction times. Doctors who responded to the poll also stated that real-time data transfer improved their level of readiness. The system architecture, implementation difficulties, and important effects on emergency response effectiveness are covered in this study. Expanding deployment, collaborating with other emergency services, and utilizing artificial intelligence for predictive analytics are some of the next possibilities to be pursued. An excellent example of how IoT and RFID technology may revolutionize emergency medical services and eventually improve patient outcomes and save lives is the Intelligent Ambulance system.

**Keywords: Radio Frequency Identification (RFID), Internet of things (IoT)**

## I. INTRODUCTION

Emergency medical services (EMS) frequently face severe difficulties in highly crowded urban locations as a result of severe traffic congestion and traffic accidents, which cause considerable delays in ambulance response times. Patient outcomes may suffer as a result of these delays, especially in situations involving cardiac arrest, trauma, and other urgent medical situations. Traditional ambulance systems frequently have trouble keeping up with traffic and don't have real-time connection with hospital personnel, which makes it more difficult to provide timely and effective medical care. We suggest the Intelligent Ambulance system, which combines RFID-based traffic control technology with cutting-edge health monitoring sensors, to address these issues. In order to improve patient assessment and readiness, this device continuously analyzes vital signs like heart rate, blood oxygen levels, and barometric pressure. It then transmits real-time data to hospital staff. Furthermore, by managing traffic lights, RFID technology establishes "green corridors," which expedite the time it takes ambulances to get to their destinations. The Intelligent LifeLine Ambulance system seeks to increase the effectiveness of emergency medical services overall, improve patient outcomes, and shorten response times by utilizing these technologies.

## II. LITERATURE SURVEY

**[1] "Traffic Light priority control for emergency vehicle using RFID", by S. Sharma, A. Pithora, G. Gupta, M. Goel, and M. Sinha:**

Ambulances and other emergency vehicles must arrive at their locations as soon as possible. Here, different edge detection and object counting techniques are used to camera image sequences in order to determine the most effective method. After that, the quantity of cars at the intersection is assessed, and traffic is effectively controlled. As long as the emergency vehicle is waiting at the traffic lane, the traffic signal indication will continuously glow green. The traffic signals immediately reverted to its previous generation pattern when the car crossed the intersection. This is something that LABVIEW can do.

**[2] "Intelligent Ambulance Management System in Smart Cities", by TugayAkca, Emre Kocyigit, OzgurKoraySahingoz and MucahidTozal:**

Method for overseeing emergency and ambulance services. This research effectively covers every aspect required to create a smart ambulance management framework, however it falls short of providing an explanation for how the system can function in real time when mobile, cloud, and standalone applications are combined.

**[3] "Automatic Health Machine for COVID-19 and Other Emergencies" by Divya Ganesh, Gayathri Seshadri, Sumathi Sokkanarayanan, Panjavarnam Bose, SharanyaRajan and Mithileysh Sathiyanarayanan:**

Method for overseeing emergency and ambulance services. This study successfully addresses every prerequisite for creating a smart ambulance management framework, but it doesn't go into detail on how the system might operate in real time by integrating standalone, cloud, and mobile applications.

**[4] "IntelligentAmbulance with Traffic Control", by Gargi Beri, Pankaj Ganjare, Amruta Gate, Ashwin Channawar, Vijay Gaikwad:**

Both a traffic control system and a health monitoring system are part of this project. Vital health metrics like the patient's body temperature, heart rate, and ECG are tracked by the health monitoring system. Through serial connectivity, these parameters are delivered to a PC in the ambulance, and the hospital server will get this data**..**

**[5] "Density Based Traffic Control using RFID in Labview", by Seetharaman R, Karthikeyan S, Saranraj M, Sankar Kumar P, Naina Mohamed M:**

This study uses RFID to measure traffic density. A reader and tags are used to calculate how many cars are in the lane. The tags are fastened to the cars, and a reader is set up on the road. The count begins as soon as the car enters the reader. Traffic signal time fluctuates based on the count. A traffic light typically opens once every 60 seconds. In accordance with the current traffic density, this system opens the signal.

**[6] "RFID based Intelligent Traffic Control System" by Mrs. Vidya Bhilawade and Dr. L. K. Ragha:**

We have developed a novel method known as the "Controller Based Intelligent Traffic Control System" using RFID. This makes use of embedded technologies and sensors. It may regulate when the red and green lights turn on and off depending on traffic, allowing emergency vehicles like ambulances to pass.

**[7] "IOT Based Traffic Control System with Patient Health Monitoring For Ambulance" by Ms. Aisha Meethian, Althaf B K, Athinan Saeed, Ligin Abraham, Mohammed Samran**

Using GPS sensor networks, the suggested method minimizes the amount of time needed to go to the hospital, hence optimizing the route. A variety of sensors, including temperature, breath, and heart rate sensors, are used to track the patient's health parameters. IOT is used to transfer these patient-recorded parameters to the hospital's database.

**[8] "Automatic Ambulance Rescue System Using Shortest Path Algorithm" by P. Arunmozhi, P. Joseph William:**

The ambulance is managed by a central unit that provides the shortest route possible to the vehicle and regulates traffic lights based on the location of the ambulance, ensuring that it arrives at the hospital without incident. The server uses the sensor systems in the car that was involved in the collision to pinpoint the accident site, and then it navigates through the ambulance to get there. Because this study is entirely automated, it can locate accident sites, manage traffic signals, and assist in getting patients to the hospital on time.

**[9] "Monitoring Patient's Healthwith Smart Ambulance system using Internet of Things (IOTs)", by Himadri Nath Saha, Neha FirdaushRaun , MaitrayeeSaha:**

The research emphasizes how IoT can revolutionize EMS by increasing its efficacy and efficiency. Saha et al.'s (2017) study shows how IoT-enabled smart ambulances may transmit data in real-time and provide continuous patient monitoring, improving readiness and expediting medical actions. It will be essential to address the issues of cost, interoperability, and data security if these systems are to be widely used and successful.

**[10] "Intelligent Ambulance – AI and Human Interface Technology", by Ashwini M, Bindu K.R, Divya K.K, and Aishwarya C:**

Intelligent ambulance systems with AI and HIT integration have the ability to completely transform emergency medical services (EMS) by boosting patient care, decision-making, and response times. The research by Ashwini et al. (2020) highlights the issues that must be resolved in order for these technologies to

be adopted more widely while also offering insightful information about the benefits, design, and use of these technologies.

## III. METHODOLOGY

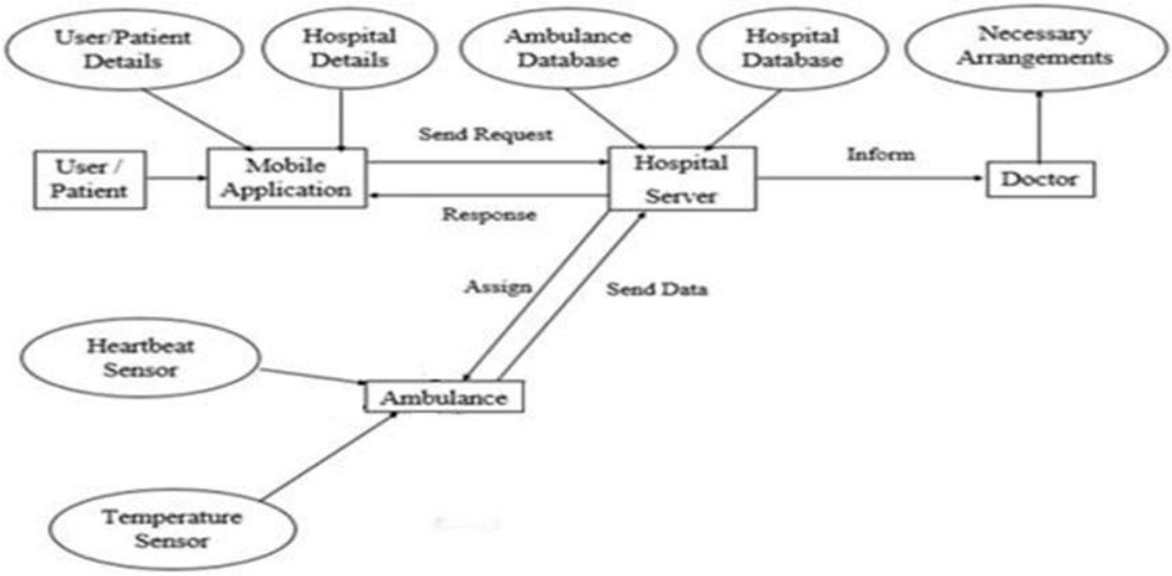



*Fig 1 Block Diagram*

**Mobile Application**:

The user, patient, and hospital data will all be stored in the mobile application. The user will enter information about the patient, including name, address, gender, blood type, date of birth, contact information, and any health issues or symptoms. Additionally, users can register as patients. The program will save information about the hospital, including its name, kind, amenities, address, and emergency phone number. The program allows users to view hospital details, select a hospital based on the patient's complexity, and request an ambulance all from within the app.

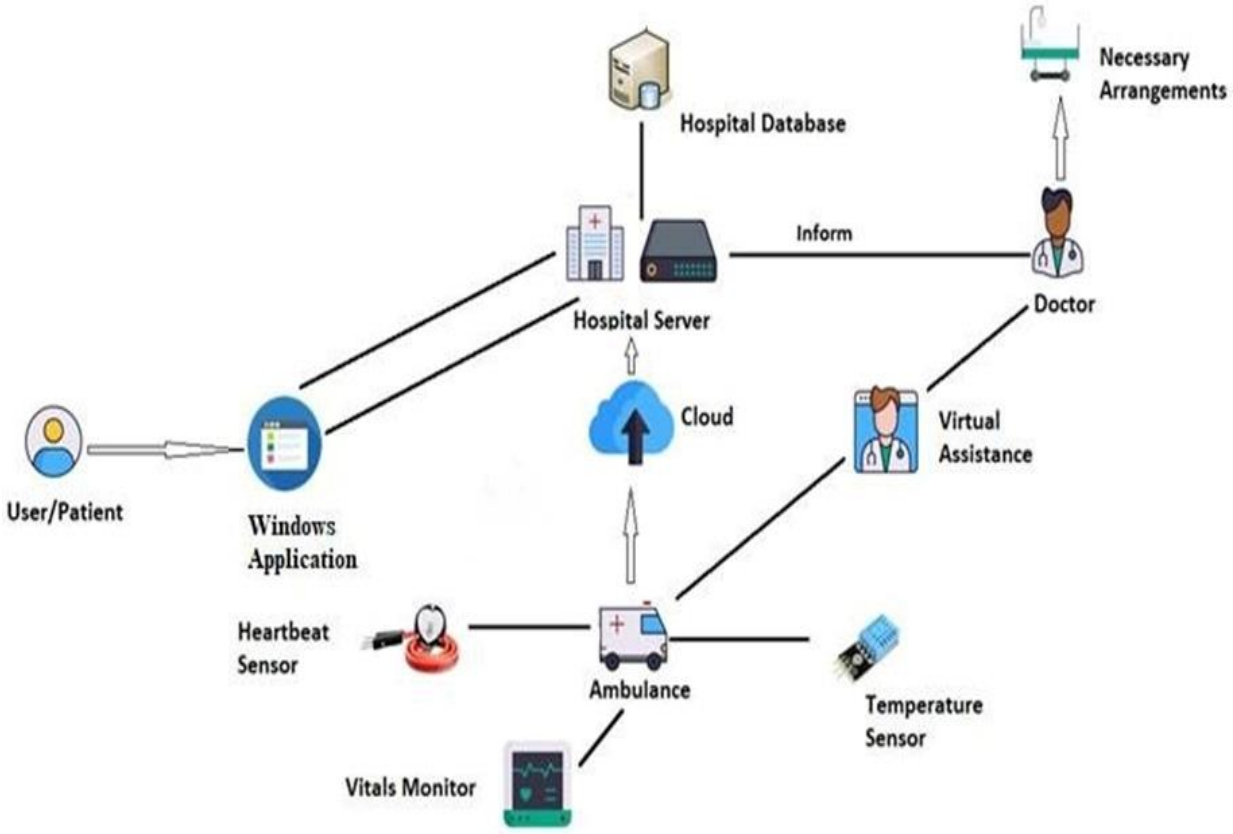
**Hospital**:

It will verify whether an ambulance is available once a user submits a request for one. The user or patient will be assigned to the ambulance if one is available. Following the patient's arrival, the ambulance will gather information about the patient's health and notify the attending physicians of the patient's status. The hospital will next set up an ICU and the physicians will administer the appropriate care based on the data.

**Ambulance**:

The most crucial component of this system is the ambulance. since it will simultaneously carry out a number of crucial functions. When an ambulance first gets a patient, it uses GPS to determine the best route to travel in order to get to the hospital as quickly as possible. The traffic signal can be managed by the ambulance. It will automatically send out a signal that can turn a red light into a green one in the event of a traffic gridlock. Additionally, it will track the health of the patients and provide the information to the hospital so that pre-hospital preparations may be made. Several biological sensors can measure certain health factors, including body temperature, heart rate, and ECG.

## IV. FLOW CHART




## V. ADVANTAGES

1. Faster Emergency Response
2. Enhanced Patient Monitoring
3. Remote Medical Assistance
4. Improved Communication and Coordination
5. Access to Specialized Care
6. Data-driven Decision Making

## VI. DISADVANTAGES

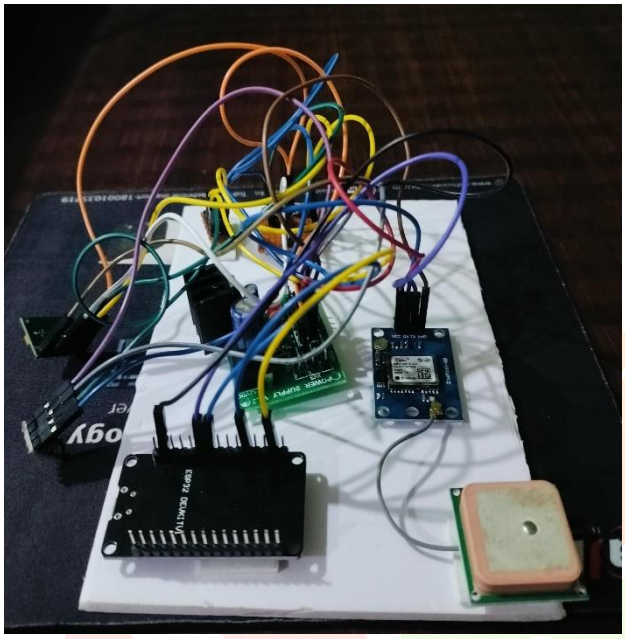
1. Reliance on Technology
2. Data Privacy and Security Concerns
3. Limited Accessibility in Remote Areas
4. Reliance on Internet Connectivity
5. Human Factors and Decision-making
6. Ethical Considerations

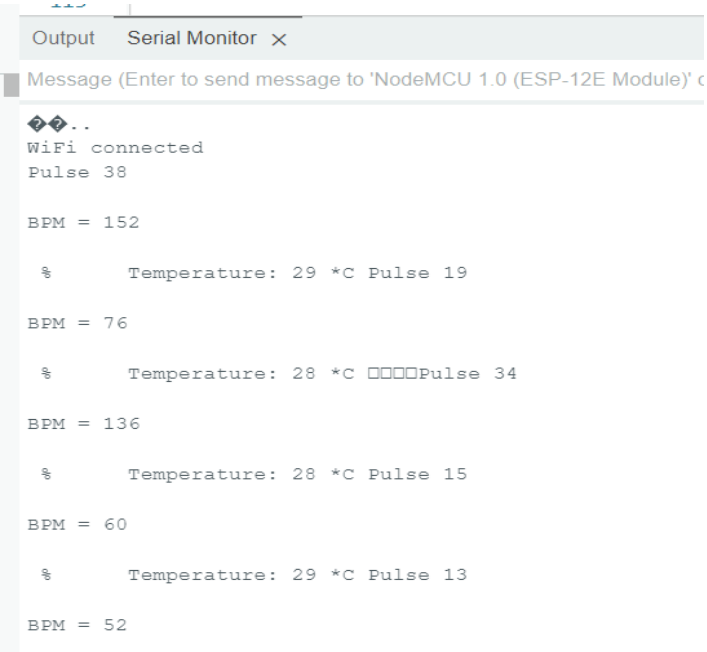
## VII. APPLICATIONS

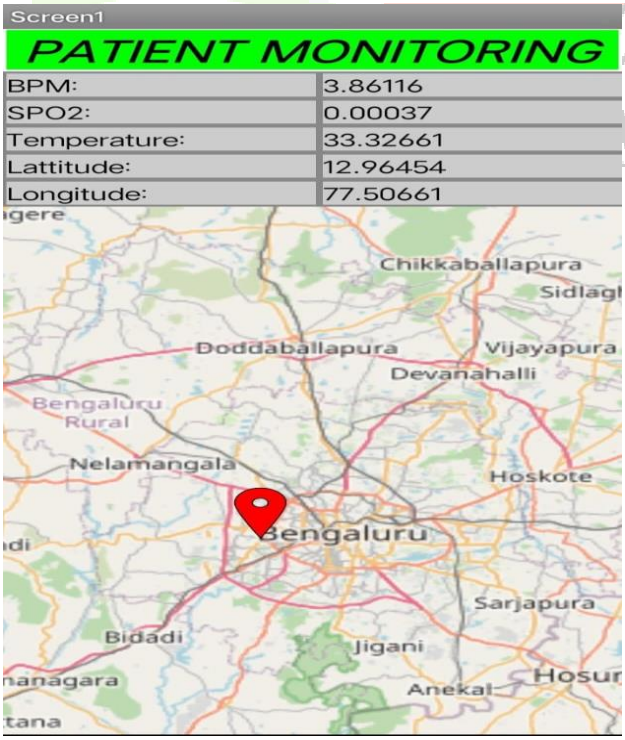
1. Efficient Emergency Response
2. Remote Medical Assistance
3. Predictive Analytics
4. Integrated Health Monitoring
5. Telemedicine Capabilities
6. Data-driven Decision Making

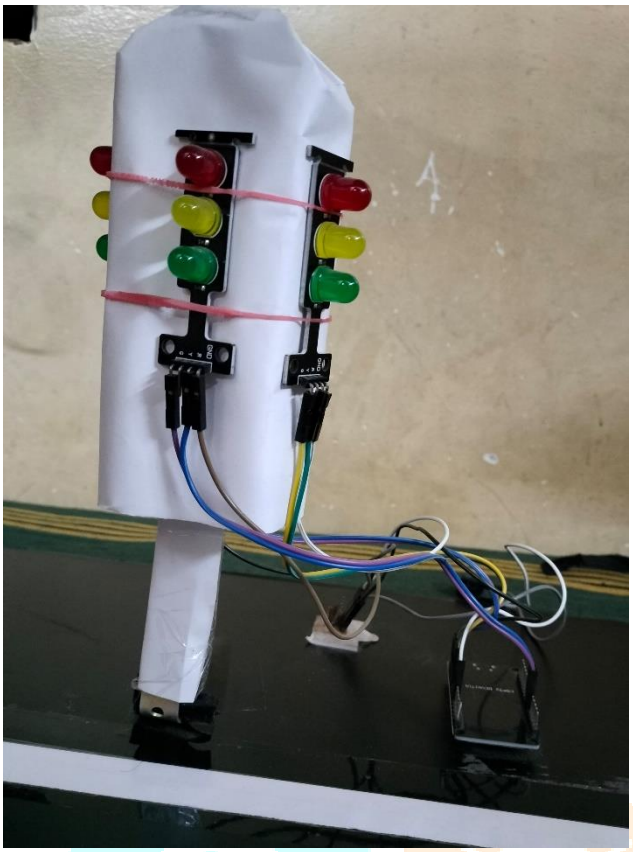
## IX. RESULT

Significant advancements in emergency medical services were achieved with the installation of the Intelligent Ambulance system. the combination of dynamic route optimization and real-time traffic control with RFID technology, which allows ambulances to travel through green corridors faster and reach their destinations sooner. Thanks to continuous monitoring and real-time data transmission to hospital staff, which enabled prompt treatments and better pre-hospital care, patient outcomes significantly improved, with a rise in survival rates for critical patients. Advanced patient information also reduced treatment delays and improved hospital preparation. User feedback from paramedics, hospital employees, and ambulance drivers emphasized the system's useful features, such as user-friendly interfaces and stress-relieving navigation assistance, while the system maintained a high level of reliability and accurate sensor data.








## IX. CONCLUSION AND FUTURE WORK

By putting in place a networked information cloud, the suggested system aims to give patients effective and efficient healthcare services. This makes it possible for medical professionals to access patient data and offer precise and timely treatments. No matter where they are or when they are, doctors can remotely assess patients thanks to this technology. By accurately and instantly monitoring vital signs like blood pressure, glucose, heart rate, and temperature, the health parameter monitoring system helps keep situations from getting to dangerous levels. In urgent cases, a notification of an alarm is sent to the hospital's monitoring website, and the attending physician gives directions on how to stabilize the patient's status via remote monitoring. This system's fundamental objective is to guarantee prompt aid, like ambulance services, and to prevent complications.

There are numerous prospects for future research and development with the intelligent ambulance system that is now being suggested. First, by adding more complex AI algorithms, including deep learning and ensemble techniques, to disease prediction models, more research may be done to improve their accuracy and dependability. This would allow for more accurate diagnosis and patient-specific therapy suggestions. Furthermore, the system can be enlarged to incorporate cutting-edge medical imaging technology, including portable ultrasound machines or remote diagnostic instruments. This would make it possible for the ambulance to have real-time imaging and diagnostics, giving medical personnel vital information they need to make educated decisions about patient care. Additionally, telemedicine features might be added, enabling medical professionals to observe and consult with patients from a distance while an ambulance is being transported. This would necessitate the creation of effective and safe communication routes as well as sophisticated platforms for telemedicine to enable smooth communication between patients and medical professionals. In summary, further development and enhancement of the intelligent ambulance and AI-powered healthcare system will be necessary. This will involve introducing cutting-edge AI algorithms, telemedicine and imaging technology integration, advanced data analytics approaches, and seamless integration with current healthcare systems. These developments will enhance patient outcomes, maximize emergency medical services, and revolutionize the way healthcare is provided.

**REFERENCES**

**[1]** S. Sharma, A. Pithora, G. Gupta, M. Goel, and M. Sinha, ―Traffic Light priority control for emergency vehicle using RFID,‖ Int. J. Innov. Eng.Technol., vol. 2, no. 2, pp. 363–366, 2013.

**[2]** TugayAkca, Emre Kocyigit, OzgurKoraySahingoz and MucahidTozal., "Intelligent Ambulance Management System in Smart Cities.," in IEEE-2020.

**[3]** Divya Ganesh, Gayathri Seshadri, Sumathi Sokkanarayanan, Panjavarnam Bose, SharanyaRajan and MithileyshSathiyanarayanan. "Automatic Health Machine for COVID-19 and Other Emergencies.," in IEEE-2021.

**[4]** Gargi Beri, Pankaj Ganjare, Amruta Gate, Ashwin Channawar, Vijay Gaikwad, "IntelligentAmbulance with Traffic Control",Upper Indira Nagar, Bibvewadi, Pune,ISSN: 2454-5031,Volume 02 - Issue 05, May 2016.

**[5]** Seetharaman R, Karthikeyan S, Saranraj M, Sankar Kumar P, Naina Mohamed M, "Density Based Traffic Control using RFID in Labview",ISSN: 2321-2004,Trichy, India,Vol. 8, Issue 4, April 2020.

**[6]** Mrs. Vidya Bhilawade and Dr. L. K. Ragha, "RFID based Intelligent Traffic Control System",Navi Mumbai, India, ISSN : 2454-9150,Vol-05, Issue-02, May 2019.

**[7]** Ms. Aisha Meethian, Althaf B K, Athinan Saeed, Ligin Abraham, Mohammed Samran "IOT Based Traffic Control System with Patient Health Monitoring For Ambulance", ISSN:2395-5252,Volume 4, Issue 8, August 2022.

**[8]** P. Arunmozhi, P. Joseph William,"Automatic Ambulance Rescue System Using Shortest Path Finding Algorithm",International Journal of Science and Research (IJSR), ISSN: 2319-7064,Volume 3 Issue 5, May 2014.

**[9]** Himadri Nath Saha, Neha FirdaushRaun , MaitrayeeSaha, "Monitoring Patient's Healthwith Smart Ambulance system using Internet of Things (IOTs)",IEEE ,978-1-5386-2215-5/17/$31.00,2017.

**[10]** Intelligent Ambulance – AI and Human Interface Technology Ashwini M, Bindu K.R, Divya K.K, Aishwarya C.