Smart Gurney System with Remote Knowledge Communication through Cloud

HariKrishnan.S[1], Balaji.G[2], Gokul Raj.S[3], SathishRaaj.V[4], Balaji.S[5]

[1,2,3,4]*Student, Dept. of. Electrical and Electronics Engineering, SRM Valliammai Engineering College, Kattankulathur, TamilNadu, India*
[5]*Assistant Professor, Dept. of. Electrical and Electronics Engineering, SRM Valliammai Engineering College, Kattankulathur, TamilNadu, India*

---***---

Abstract - Emergency Medical Service (EMS) is a service provided for patients those who are in critical health conditions. Presently, the patient's health conditions and personal details are found only after their arrival to hospital due to which a time delay is created to begin the treatment and also leads to death in case of severities. The major focus of our proposed system is on accident victims, whose major health conditions and personal details are updated to the hospital and police station from the ambulance before their arrival at hospital. This system can also be used for other medical complications or emergencies by slight modifications. Also, to avoid time delay due to traffic we are controlling the traffic signals through Radio Frequency technology

Key Words: Internet of Things (IoT), Emergency Medical Service, RF, Sensors

1. INTRODUCTION

The objectives of this project is to provide an effective system model that will track and monitor patient vital readings in order to provide efficient medical services in time. By using sensors, the data will be captured and compared with a predefined threshold. The study focuses on heartbeat rate, and body temperature, thus in case of emergency an SMS will be sent to the Doctors mobile containing measured values and position. A biometric sensor is used to get patient personal information. This information is updated to hospital and police station through Internet of Things. With this information, an alert will be messaged to patient's relatives by cop.

This paper consists of four sections. The section II consists of the information about the existing system of medical services. The section III includes the idea of proposed system of medical service to be implemented. The section IV consists of System Description and finally the section V consists of Conclusion with which the paper ends.

2. EXISTING SYSTEM

- Based on the survey, till now, even hospital aide informs the live status of patient, there is no any smart system to inform patient's live condition to nursing home through online

- Also it is must to inform immediately about accident to relatives and police station to proceed legal activities.

- In existing, it is also noted that minimum two workers are required to push stretcher safely.

DISADVANTAGES:

- No automated system for information sharing.

- Time delay may occur to begin treatment.

3. PROPOSED SYSTEM

- The proposed system consists of two sections namely ambulance section and hospital section

- In ambulance section, there are many health monitoring sensors to monitor patient live health parameters that are implemented in stretcher

- This information is updated to hospital via server for every second. Also it is necessary to inform about accident and patient personal details to nearby police station

- For this, a biometric sensor is used to get patient personal information. This information is updated to hospital and police station through Internet of Things. With this information, an alert will be messaged to patient's relatives by cop.

- Second section is hospital section. After reaching hospital, it is must to admit the patient in intensive care unit as soon as possible. But there are many obstacles that may interfere between entrance and care unit.

- Till now, hospital workers move the stretcher manually. It may take some time delay due to applying human power. To solve this issue, a stretcher control mechanism is implemented in this system which is controlled by microcontroller

- By initiating this mechanism, stretcher moves automatically by stretcher moving mechanism with guidance of human

- If the stretcher moves very fast or uncontrollable, then an emergency stop switch will be activated automatically to stop litter.

- A sonic humidifier sensor is implemented to detect whether any person or other object interferes in stretcher path. If any interfere occurs, alerting system is activated to avoid such interferes.
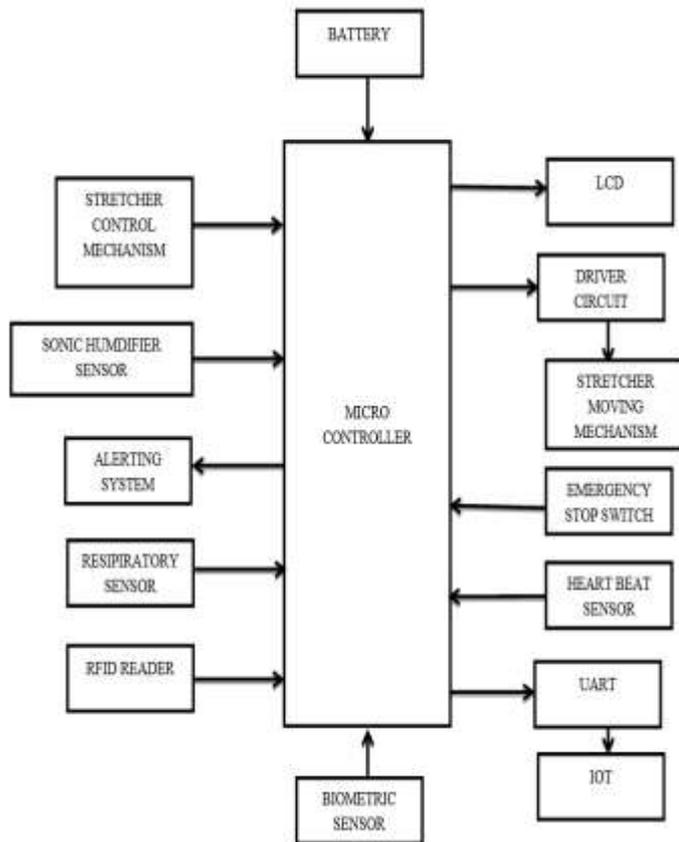
Fig.1 Stretcher Section
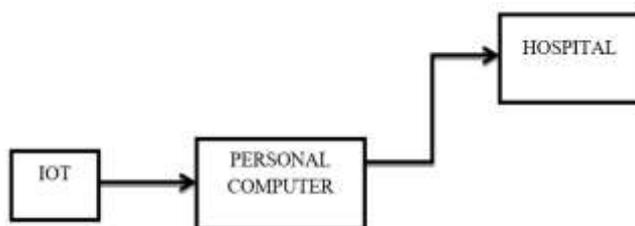
Fig.2 Monitoring Section
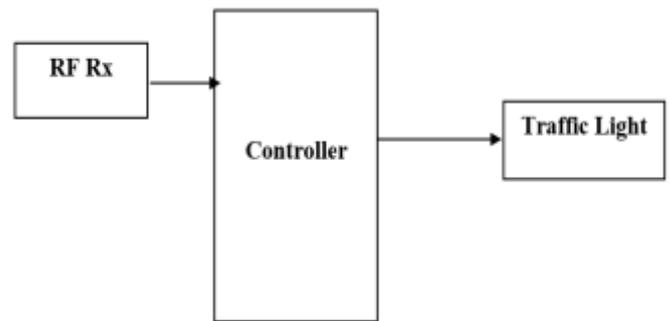
Fig.3 Traffic Signal Section

ADVANTAGES:

- Many human lives can be saved.

- Easy to install in all hospitals.

- Easy to decide treatment process prior to patient's arrival to hospital

4. SYSTEM DESCRIPTION

- The main aim of the project is to monitor patient live health parameters that are implemented in stretcher. This information is updated to hospital via server for every second. Also, it is necessary to inform about accident and patient personal details to nearby police station.

- Biometric sensor is used to get patient personal information. This information is updated to hospital and police station through Internet of Things. With this information, an alert will be messaged to patient's relatives by cop.

- The usage of advanced IoT technologies in pregnant women care environment, absolutely eradicates the pregnancy complications and harmful incidents [6].

- The system is implemented on IoT based an embedded platform and equipped with a novel bio-metric system.

IoT:

The Internet of Things (IoT) is an ecosystem connected of physical devices that are accessible through the internet [9][10]. The IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit [9]. The concept Internet of Things (IoT), each device can be connected to the internet or intranet, or to other devices on the network [10]. This enables the collection of a variety of information from the devices, including data on operations, configuration, energy consumption, and the power factor. The IoT enables devices to make smart

decisions based upon analytical rules that serve the purpose of the devices best [11]. The devices can send, receive, store, and control information, sending the information individually to another device or broadcasting it to all devices.

Bio-metric Sensors:

Everyone in this world has marks on their fingers. These marks have a pattern and this pattern is called the fingerprint. Since, they are unique and cannot be removed or changed, they have become ideal means of biometric identification. An image of the user's fingerprint is captured by fingerprint scanner. This captured image is called as live scan. The live scan is processed digitally to create a biometric template (a collection of certain extracted features) which is stored and used for matching [8]. Identification of fingerprints of individuals is done on the basis of both hardware and software techniques.
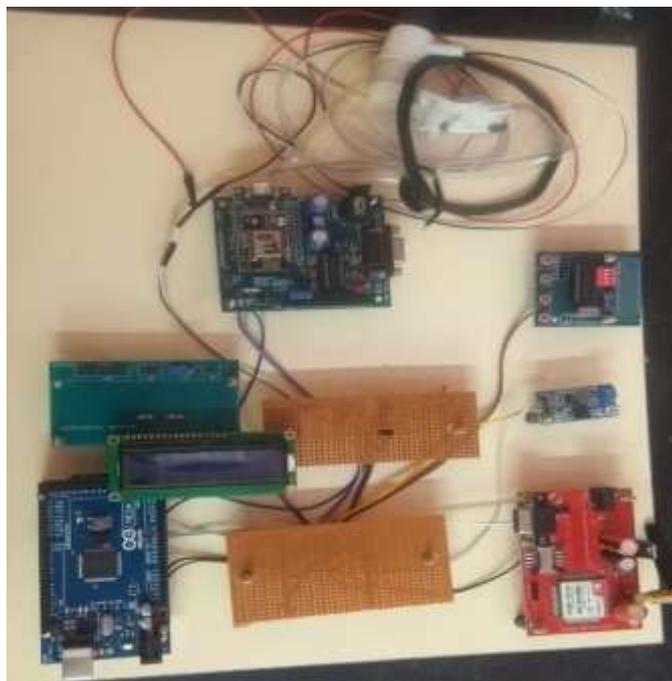
Fig.4 Hardware design of Stretcher Section
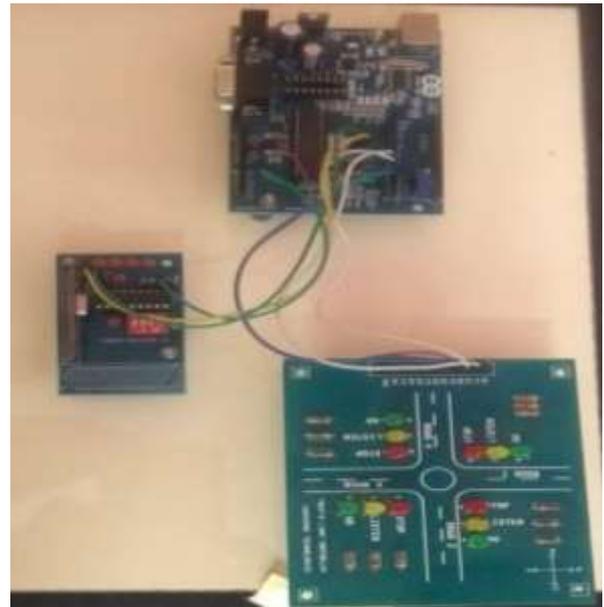
Fig.5 Hardware design of Traffic Signal Section

The Internet of Things (IoT) is the scenario in which objects, animals or people are provided with unique identifiers, and the ability to transfer data over a network without requiring human-to human or human-to-computer interaction [1][5]. IoT revolves around increased machine-to machine (M2M) communication and encompasses wireless embedded sensors and actuators that assist users in monitoring and controlling devices remotely and efficiently [4][9]. This innovation will be enabled by the embedding of electronics into everyday physical objects, which will allow them to integrate seamlessly with the existing infrastructure [6][10].

The Fig.4 shows the hardware connections of the stretcher section which has respiration, temperature and heartbeat sensors for monitoring the patient's conditions and also the GSM and IoT modules are there for communicating the information to police station and hospital. RF Transmitter is added to this section for Traffic light control

The Fig.5 shows the hardware connections for the prototype of Traffic light controlling section, it consists of a RF receiver to know the arrival of ambulance and it is demonstrated with the help of a basic Traffic light controller kit.

Fig.6 Output of Patient's Basic Details Displaying using 16x2 LCD

Fig.7 Output of Patient's health monitoring using 16x2 LCD

The Fig.6 shows the output of basic details of the patient which is obtained by using Fingerprint sensor and Fig.7 shows the output of patient's health monitoring in which Temperature, Heartbeat and Respiration of patient is measured with the help of several sensors used in stretcher section.

Fig.8 Output of Traffic Light Control on either direction of road

The Fig.8 depicts the output of Traffic light control using RF technology. In the first picture of Fig.8 if the ambulance arrives in North or South of the junction road then the signals of other two sides(East and West) will turn Red and the Ambulance will not have any traffic delay and similarly the second picture shows the same concept of output for other two directions where the output will be vice versa from the first one.

5. CONCLUSION

Now-a-days accidents have become more common and This work is developed with a main intension of saving the life of an accident victim. Whenever an accident occurs in a vehicle, the victim details identified using biometric sensor, and also information send to victim relation and hospital, police. The traffic is cleared for the smooth and fast running of the ambulance. And at the same time, the patient's condition inside the ambulance is monitored frequently and the information is updated in a web page, which could be viewed by the doctor at the hospital and make the necessary arrangements.

6. REFERENCES

- [1] Sean Dieter T.K., Nagender Kumar S., Subhas Chandra M. "Towards the Implementation of IoT for Environmental Condition Monitoring in Homes" IEEE Sensors Journal Volume: 13, Issue: 10, Oct 2013.

- [2] K.V. Teja, Suresh Angadi "Detection and Notification System in Trains" IJIRSET Vol. 2, Issue 4, April 2013.

- [3] Vivek.P. J, Raju.G, Akarsh S. "Forest Fire Detection System (FFDS)", IJIRSET, Vol. 3, Issue 6, June 2014.

- [4] Pandian D.R, Dr. Mala.K "Smart Device to monitor water quality to avoid pollution in IoT environment", IJETCSE, Vol.12 Issue 2 –Jan 2015.

- [5] Shifeng Fang, Li Da Xu, Senior Member, IEEE, Yunqiang Zhu, Jiaerheng Ahati, Hua Pei, Jianwu Yan, and Zhihui Liu "An Integrated System for Regional Environmental Monitoring and Management Based on Internet of Things", IEEE, Vol: 10, Issue: 2, May 2014.

- [6] Mamadi manisha, katakam neeraja on "IOT on heart rate monitoring and heart attack detection" published by IJIET. Volume 7 Issue 2, August 2016

- [7] Rahul gaiwad 'Internet of Things (IoT): "Revolution of Internet for Smart Environment", International Conference 2016, 134-142

- [8] Shirshankar Basu, Md. Arshad Feeroz, Diljit P R., Neha Firdaush Raun, Faraz Alam "Spark core based wireless remote door lock and multiple access", IJARCSSE, Vol: 5, Issue 4, 2015.

- [9] Jayavardhana Gubbi, a Rajkumar Buyya, Slaven Marusic, a Marimuthu Palaniswamia "Internet of Things (IOTs): A Vision, Architectural Elements, and Future Directions", Elsevier September 2013

- [10] J. Sherly, D.Somasundareswari ," Internet of things based Smart transportation system" IJRET, Vol: 02 Issue: 07 Oct-2015.

- [11] Zhang Min, Yu Tao, Zhai Guofang "Building an intelligent transport system using internet of things (IOT)", Applied Mechanics and Materials Vol.48-49, 1073-1076

Websites:

- "Smart IoT Technologies for Adaptive Traffic Management Using a Wireless Mesh Sensor Network", Available: http://advantech-bb.com/smart-iottechnologies-for-adaptive-traffic-management-using-awireless-mesh-sensor-networks.

- Paul keisch, "Here is what internet of things will do for intelligent transportation", Available:https://www.linkedin.com/pulse/here-what-internetthings-do-intelligent-paul-keisch .