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SURVEY ON AMBULANCE TRACKING WITH PATIENT HEALTH MONITORING SYSTEM USING GPS

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Abstract: Proposed system presents design of such a monitoring system for emergency patient transportation. The system will be useful for monitoring ambulance location using Google map and GPS. Numbers of road accidents in India are the highest across the world. Using advance wireless technology of GPS, it is possible to provide medical facility to accident victim within short period of time. Continuous monitoring of ambulance location and status of patient during the critical hour of patient transportation helps to improve medical care. One of the issues during transportation of patient is traffic related problems. It is therefore necessary to have a fast, economical and efficient traffic control. It can display location of ambulance and status of heart bit rate and temperature of patient. After receiving SMS hospital can prepare their staff for proper treatment of coming patient. Proposed system track the way of ambulance coming and it makes all the signals green on the same track after sensing the ambulance. Proposed system also stores the patient's historical information that will helps to get better treatment. Patient's data can be fetched by using bio-metric device which will be available in ambulance vehicles

Keywords: Body Area Networks, Health-Monitoring, Wearable Systems, Biometric, GPS, IOT.

I INTRODUCTION

The main concept behind the proposed system is to provide a smooth own for the ambulance to reach the hospitals in time and thereby minimizing the delay caused by traffic congestion. The ARDIUNO system is used to alter the traffic lights upon its arrival at traffic light junction which would save a lives at critical time. To avoid unnecessary traffic signal changes. In the current situation itself, transportation of a patient to hospital in emergency conditions seems quite simple but in actual it is very difficult during peak hours. Moreover, the situation is gets worse when emergency vehicles have to wait for other vehicles to give way at intersections with traffic signals. As the survey aye 95% of the heart attack cases can be treated, if the ambulance can reach the hospital at current time without stocking into the traffic. In future it may get even worse.

In this cause Recovery action need to be taken immediately. So, for our over populated environment, there is a real need for this paper for the society to make easier day to

day transportations. This paper will help to reduce blockage of emergency vehicles in traffic and helps to provide immediate recovery. Mobile app to authenticate emergency and non-emergency conditions of ambulance. GPS to track the nearest traffic signal post to the ambulance and to send the app data to that particular signal post. The main goal is sharing of information between patient and hospital. This information involves patient's medical data, current condition and the most important thing location of ambulance. When the patient or his career has exact idea when the ambulance is arriving, they can take proper action according to feedback received. Similarly if the hospital knows when the patient is arriving, they can prepare for it efficiently. The sensor is capable of sending ambulances location to a server, from whereat can be accessed by the hospital and the patient. This is the core part of the proposed Ambulance Tracking System (ATS), which provides real time location updates of ambulance to the hospital and to the patient who has requested the ambulance. In addition to this, the system also provides the functionality of sharing patient's medical data with hospital, so they can take proper measures beforehand.

II LITERATURE SURVEY

A. Pantelopoulos and N. Bourbakis, \ A survey on wearable sensor-based systems for health monitoring and prognosis ", IEEE Trans. Sys., Man, and Cybernetics, Part C: Applic. And Reviews, vol. 40, no. 1, pp. 112, Jan 2010.

In this paper, The design and development of wearable biosensor systems for health monitoring has garnered lots of attention in the scientific community and the industry during the last years. Mainly motivated by increasing healthcare costs and propelled by recent technological advances in miniature bio sensing devices, smart textiles, microelectronics, and wireless communications, the continuous advance of wearable sensor-based systems will potentially transform the future of healthcare by enabling proactive personal health management and ubiquitous monitoring of a patient's health condition. These systems can comprise various types of small physiological sensors, transmission modules and processing capabilities, and can thus facilitate low-cost wearable unobtrusive solutions for continuous all-day and any-place health, mental and activity status monitoring. This paper attempts to comprehensively review the current research and development on wearable biosensor systems for health monitoring. A variety of system implementations are compared in an approach to identify the technological shortcomings of the current state-of-the-art in wearable biosensor solutions. An emphasis is given to multi-parameter physiological sensing system designs, providing reliable vital signs measurements and incorporating real-time decision support for early detection of symptoms or context awareness. In order to evaluate the maturity level of the top current achievements in wearable health-monitoring systems, a set of significant features, that best describe the functionality and the characteristics of the systems, has been selected to derive thorough study.

Moeen Hassan alieragh and Alex Page, \ Health Monitoring and Management Using Internetof-Things (IoT) Sensing with Cloud-based Processing: Opportunities and Challenges ",IEEE International Conference on Services Computing 2015.

In this paper, Among the panoply of applications enabled by the Internet of Things (IoT), smart and connected health care is a particularly important one. Networked sensors, either worn on the body or embedded in our living environments, make possible the gathering of rich information indicative of our physical and mental health. Captured on a continual basis, aggregated, and effectively mined, such information can bring about a positive transformative change in the health care landscape. In particular, the availability of data at hitherto unimagined scales and temporal longitudes coupled with a new generation

of intelligent processing algorithms can: (a) facilitate an evolution in the practice of medicine, from the current post facto diagnose-and treat reactive paradigm, to a proactive framework for prognosis of diseases at an incipient stage, coupled with prevention, cure, and overall management of health instead of disease,(b) enable personalization of treatment and management options targeted particularly to the specific circumstances and needs of the individual, and (c) help reduce the cost of health care while simultaneously improving outcomes. In this paper, we highlight the opportunities and challenges for IoT in realizing this vision of the future of health care.

1. Ahmet Aris and Sema F. Oktu g, Nesnelerin Interneti G¼venligi : Servis Engelleme Saldirilar” Internet-of-Things Security : Denial of ServiceAttacks "

Internet of Things (IoT) is a network of sensors, actuators, mobile and wearable devices, simply things that have processing and communication modules and can connect to the Internet. In a few years time, billions of such things will start serving in many fields within the concept of IoT. Self configuration, autonomous device addition, Internet connection and resource limitation features of IoT causes it to be highly prone to the attacks. Denial of Service (DoS) attacks which have been targeting the communication networks for years, will be the most dangerous threats to IoT networks. This study aims to analyze and classify the DoS attacks that may target the IoT environments. In addition to this, the systems that try to detect and mitigate the DoS attacks to IoT will be evaluated.

2. Mohammad A. Al-Khedher, \ Hybrid GPS-GSM Localization of Automobile Tracking System ", International Journal of Computer Science & Information Technology (IJCSIT) Vol 3, No 6, Dec 2011

An integrated GPS-GSM system is proposed to track vehicles using Google Earth application. The remote module has a GPS mounted on the moving vehicle to identify its current position, and to be transferred by GSM with other parameters acquired by the automobile's data port as an SMS to a recipient station. The received GPS coordinates are filtered using a Kalman filter to enhance the accuracy of measured position. After data processing, Google Earth application is used to view the current location and status of each vehicle. This goal of this system is to manage eet, police automobiles distribution and car theft cautions.

3. Smart Real-Time Healthcare Monitoring and Tracking System using GSM/GPS Technologies", The Master of IEEE Projects 2015

Health monitoring systems have rapidly evolved recently, and smart systems have been proposed to monitor patient current health conditions, in our proposed and implemented system, we focus on monitoring the patient's blood pressure, and his body temperature. Based on last

decade statistics of medical records, death rates due to hypertensive heart disease, shows that the blood pressure is a crucial risk factor for atherosclerosis and ischemic heart diseases; thus, preventive measures should be taken against high blood pressure which provide the ability to track, trace and save patient's life at appropriate time is an essential need for mankind. The objective of this work is providing an effective application for Real Time Health Monitoring and Tracking. The system will track, trace, monitor patients and facilitate taking care of their health; so efficient medical services could be provided at appropriate time.

Somanath Tripathy, \ Design and Evaluation of an IoT enabled Secure Multi-service Ambulance Tracking System ", IEEE Region 10 Conference (TENCON) | Proceedings of the International Conference 2016

The Internet of Things (IoT) systems enable the communication of adverse suite of devices and objects, however it is known that security is one of the major problems in these systems. This is mainly due to the fact that IOT devices work with very limited computational power and energy budget and conventional cryptographic techniques will be too expensive. To this end, we propose a novel hybrid security protocol and demonstrate its suitability through a real time ambulance service tracking application. First, we discuss practical problem that is of lack of information shared during transfer of a patient in ambulance to hospital. We provide a solution to this with an IOT enabled ambulance tracking system. Second, we provide a secure protocol for IoT devices specific to the tracking system. The protocol uses implementation of AES-CCM optimized for IoT devices. It provides the basic communication requirements such as confidentiality, authentication and data integrity. The system works in a Server-Client model and we use dual channel to communicate with the IoT module. One secure channel (SMS), through which key exchange occurs, and one insecure (Internet), through which encrypted data is transferred. Finally, we present the evaluation metric of the proposed system including memory footprint and energy consumption.

Bing-Yuh Lu and Ming-Kwen Tsai, \ Distant Auscultation System for Detecting Lung Sounds of Patients on Ambulances"

The sound of the siren of the ambulance is for the safety of the road transportation, but interferes the auscultation of the lung and heart sounds. The system implementations included by (1) ACER Aspire 17 notebook as a server in right side; (2) HwaWei AmazingA6 smart mobile as a hot point in the middle; and (3) ACER Aspire 5 notebook as a client which the settings include IP address of host computer, and client, read and, write privileges of the data sockets, and running of NI data socket manager, and data socket server. Therefore, the parameters in the real-timed AS

are veri_ed as the better ones to prepare for the services on the ambulance.

III PROBLEM STATEMENT

Numbers of road accidents in India are the highest across the world. If victim doesn't get any medical treatment then victim can lost his/her life. Now a day's traffic increases rapidly therefore ambulance will get stuck in emergency. Hence, need to solve the problem of traffic to get the medical facility to accident victim within short period of time.

IV SYSTEM ARCHITECTURE

The system consists of an end-to-end smart health application that can be building up from two functional building blocks. Main function of the first building block is to gather all sensory data that are related to the person's information by using the thumb impression, whereas the second block functions are to store, when the ambulance is going if in case the traffic is present than automatically signal goes blue so the ambulance can easily go to the hospital. In the proposed system it saves the patient's time and in some accident person body not identified in this situation by using thumb impression we can find out person information. The function working is illustrated as, when the patient's heartbeat rate changes badly, the Arduino which recorded all the patient's information, GSM shield to send an SMS message containing this information, patient ID and the location of the patient which has been taken via GPS shield, to his doctor's mobile phone, who -by his turn send an ambulance to the patient's location.

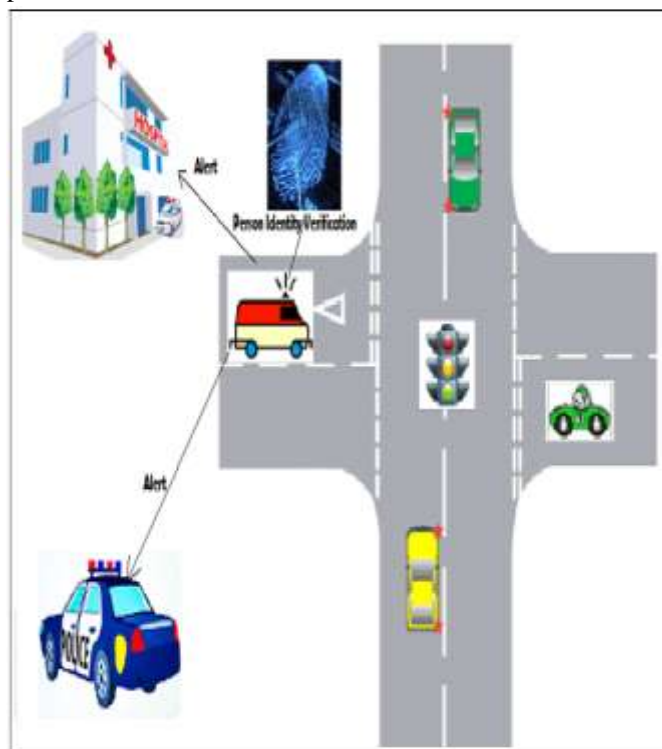


Figure 1. System Architecture

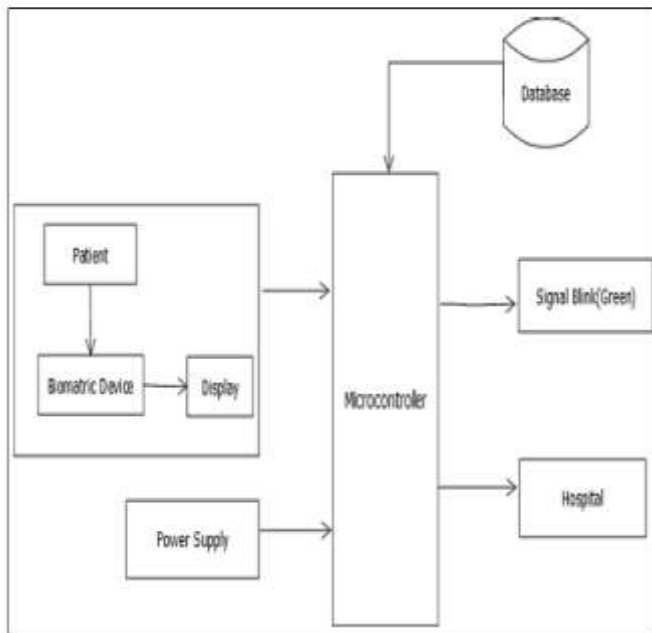


Figure 2. Block diagram

V MODULES

Proposed system mainly consist of six modules

Module 1: Hospital

The time between contacting hospital and when the ambulance delivers patient to hospital is very crucial. In many cases the doctors don't know what is wrong with patient till he reaches the hospital or sometimes it happens that when the patient reaches' hospital it is found that some required medicine or tools are not present which are required for treatment. This is very much the scenario in developing countries. This gaping information sharing can sometimes prove to be fatal. In such situations it is better to utilize the time of transportation of patient to gather information about him/her so that the hospital can prepare beforehand foray emergency. The doctors can know exactly what is wrong with the patient while he is being transported and procure any required tools or medicine in that time. Utilizing this gap in exchange of information to do useful tasks can impact lives of many, who might have suffered in case there was delay in communication. In the proposed system we can easily monitor the patient.

Module 2: Fingerprint

A fingerprint in its narrow sense is an impression left by the friction ridges of a human finger. In our system we can use fingerprint for getting person information like name, blood group, previous medical history etc. By using thumb impression we can get patients information easily.

Module 3: Police

Police get information related to the patient like patient name, I'd and location using this information police easily investigates patient.

Module 4: Registration

In the registration first all doctors, people and patient register to the system.

Module 5: Patient

The Real Time Health Monitoring and Tracking system will help people for critical condition when the personas unconsciousness or any major accident time. The system will track, trace, monitor patients and facilitate taking care of their health; so efficient medical services could be provided at appropriate time.

Module 6: Admin

A registered customer wants to change their account details (email, password, address, update new medical reports, etc.). After first being authenticated by the system, the customer will be presented with a prefilled form with all of their existing information. The customer will make whatever changes he/she wishes to make and submit. The system will validate the information and save it in the database. Admin also control both modules system administrator wants to manage the garage remotely. After being authenticated by the system, The administrator will give all the information to the doctor as well as police.

Mathematical Model

Let S be the whole System,

$$S = \{ I, P, O, R \}$$

$$I = \{ I0, I1, I2, I3, I4 \}$$

I0 - Common people(n1, n2. . . nn)

I1 - Personal health details on government portal

I2 - Biometric information fingerprint information

I3 - Accident Location(L1, L2)co-ordinates

I4 - Hospital and police station details.

$$P = f P1, P2, . . . P4g$$

P0 = Process the details provided by people

P1 = Match biometric provided by user after accident

P2 = Find nearest hospital and police station

$$Ucli\ distance(X,x1) = \sqrt{\sum(xj-xij)^2}$$

P3 = Send RFID signals

P4 = Change signal if emergency situation

O0 = Alert message to hospital and police

A = {health details, blood group, current location }

O1 = change in track signal (Y.G.R)

VI SYSTEM REQUIREMENT AND SPECIFICATION

Hardware Resources Required

1. Arduino
2. System : Pentium IV 2.4 GHz.
3. Hard Disk : 40 GB.
4. Floppy Drive : 1.44 Mb.

Software Resources Required

1. Operating System: Windows 7
2. Programming Language: Java
3. Toolkit: Android 2.3 ABOVE
4. IDE: Android Studio

VII CONCLUSION AND FUTURE WORK

This system will reduce accidents which often happen at the traffic signal intersections because other vehicles have to huddle to give way to the ambulance services. The proposed system is useful for critical patient information easily find out. It provides transportation unit information and as well as patient health information, which is useful in further emergency treatment for doctors. The Ambulance tracking system can help in saving many lives. It can also send current location using GPS system to the server database. The server in turn sends location and status information to the doctor.

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