

# **SURVEY PAPER FOR HEALTH RECOMMENDER SYSTEM**

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## **ABSTRACT**

*At times, it is a challenge to take care of adolescent health especially in the present times of competitiveness. Some behavioral pattern during their schooling period can be captured and recorded that can directly or indirectly relate to their well being. In the present paper, we have proposed a Health Monitoring System (HMS) which has the capability to spontaneously monitor physiological parameters of the attributes of adolescent. The HMS mainly consists of sensors, Wi-Fi module (ESP8266) and software. The Wireless Body Sensors (WBS) is attached on adolescent body to sense physiological parameters and enclose respective statistics on Server. HMS can detect the thoughtful conditions, if emergency arises then notify to concern person. The amplified and filtered signals from the sensors are input into the Wi-Fi module (ESP8266) where acts as the control unit of the business logic. A graphical user interface (GUI) has been designed to communicate with the hardware as well as to display real-time emotion(s) for the monitored period. The monitoring provide analysis report, mines appropriate symptoms and provide recommender system than can be useful to the parents as well as the concerned doctor/family physician.*

**Keywords:** *Health, Health Monitoring System(HMS)Disorder,Symptoms, Wireless Body Sensor, Wi-Fi module (ESP8266).*

## **I INTRODUCTION**

Improving human health has been the subject of many research investigations. In this paper we are providing a monitoring system which has the capability to spontaneously monitor physiological parameters of adolescent and scholar and according to that generate analysis report. The sensors are attached on victims body in the form of wireless body sensor network(WBSN) this Wireless Body Sensor (WBS) are able to sense physiological parameter such as heart rate, temperature and pulses and send this information to server. This system can detect the normal and abnormal conditions, if any issue then notify to concern person using message/email. Information contained in e-mail/message the health-care professional can provide necessary medical advising. Victims temperature, heart beat rate, and pulses data are monitored, displayed, and stored by our system. The system mainly consists of sensors, the data acquisition unit, micro-controller and software. The motivation for this project is to build a successful design which is recommender system for adolescents health .It also provides recommendation to concern person. As we know that

people are sluggish for visit a doctor for health checkup so that our aim is to consume adolescents time for such a task.

## II LITERATURE SURVEY

1) "A Healthcare Monitoring System Using Wireless Sensor Network with GSM", Prof. Sunil L. Rahane, Prof. Ramesh S. Pawase.

By using Wireless sensor networks we make patients life more relaxed and provide sustainable solutions. The safety is very important in monitoring of healthcare which may provide by wireless sensor network. So it is an emergent research topic and it is worth studying. This paper provides a clearly wide-ranging study of security research in healthcare application using WSNs. This paper presents the design, deployment, and evaluation of a wireless pulseoximetry monitoring system in a hospital unit. The study presented in this paper encompasses real patients monitored in a clinical setting. The patients were monitored in to realistically assess the probability of WSN technology for patient monitoring.

2) "Development of a Device for Remote Monitoring of Heart Rate and Body Temperature"

, Mohammad Arhekur Rahman, Atanutarai, et al.

In this paper, we have shown a design of a new remote heart rate and body temperature monitoring device. The final result of our approach is a remote health condition measurement system with a flexible architecture that can be adopted in several diverse application fields. The system has been tested and valid for some biosignals such as heart rate and body temperature. The biosignals are measured in a real time with a higher correctness but more cost effective than the old hand measuring system.

3) "Algorithms Based on CWT and Classifiers to Control Cardiac Alterations and stress Using an ECG and a SCR", Mara Viqueira Villarejo, Begoa Garca Zapirain, et al.

The base of the developed algorithm is the CWT, so this application aids the exposure of ECG oddities in real time without being influenced by the users' movements. The device used for the study of the ECG is a commercial device which can be worn by the users while they are playing sports. It is certainly very comfortable for those cases where it is necessary to study the reaction of the body in status quo requiring effort. As the device communicates via Bluetooth, it would be conceivable to implement this algorithm in a mobile phone.

4) "Secured Smart Healthcare Monitoring System Based on Iot", Bhoomika B. K., Dr. K. N. Muralidhara.

Technology plays the major role in healthcare not only for sensory devices but also in announcement, recording and display device. It is very important to monitor a number of medical parameters and post operational days. Hence the latest trend in Healthcare communication method using IOT is adapted. Internet of things serves as a compound for the healthcare and plays a prominent role in a wide range of healthcare applications. In this project the PIC18F46K22 micro-controller is used as a gateway to communicate to the various sensors such as temperature sensor and pulse oximeter sensor. The data can be accessed anytime by the doctor.

5 )”Zigbee Based Wearable Remote Healthcare Monitoring System for Elderly Patients”, Khalifa AlSharqi, Abdelrahim Abdelbari, Ali Abou-Elnour, and Mohammed Tarique.

In current years remote healthcare monitoring system is attentive. As the aging populations are increasing and at the same time the healthcare cost is going through the ceiling there has been a need to monitor a patient from a remote location. In this work we present a ZigBee based wireless healthcare monitoring system that can provide tangible time online information about the health condition of a patient. The proposed system is able to send alarming messages to the healthcare specialized about the patient's critical condition. In addition the proposed system can send reports to a patient monitoring system, which can be used by the healthcare professionals to make obligatory medical advices from anywhere of the world at any time.

6 )”Emotion Recognition by Heart Rate Variability”, Hany Ferdinando, Liang Ye, et al

This work provided a baseline for emotion recognition research based on ECG signals. Using data from the Mahnob database, we obtained an accuracy of 47.69 and 42.55 for arousal and valence, respectively. These values do not differ significantly from those reported on (Soleymani, et al., 2012) for peripheral physiological signals. If emotion was determined not only in terms of valence and arousal but also in terms of dominance, this work could be seen as an extension of the previous effort.

Sr.No.	Problem Statement	Existing System	Advantage	Disadvantage
1	<i>A Healthcare Monitoring System Using Wireless Sensor Network with GSM</i>	WSN for patients health status detection	Provide quick service to patients.	Network connectivity issue.
2	<i>Development of a Device for Remote Monitoring of Heart Rate and Body Temperature.</i>	Ethernet technology and widely spreading internet.	Remote health condition measurement system and cost effective.	It needs a computer to send data to the web server through the internet.
3	<i>Algorithms Based on CWT and Classifiers to Control Cardiac Alterations and Stress Using an ECG and a SCR.</i>	Continuous Wavelet Transform algorithm is used.	Detection of anomalies and stress by using wearing only one device.	Some stress stages can be detected by GSR but not by pulsimeter.
4	<i>Secured Smart Healthcare Monitoring System Based on Iot</i>	Internet of Things (IoT) used for health care	Quick provisional medication can be done by this system.	Security issues.
5	<i>Zigbee Based Wearable Remote Healthcare Monitoring System for Elderly Patients.</i>	Zigbee technology is used for sending alert message	Patients medical report can be used anywhere in the world	Limited coverage area.

**Figure 1: Literature Table**

## III PROPOSED HEALTH MONITORING SYSTEM

The proposed architecture helps in understanding Health Recommender System for Adolescent. The components of the following architecture are: Wireless Body Sensor (WBS), WiFi module ESP8266, and Desktop device for desktop as well as mobile. The descriptions of the above named components are as follows:

### 3.1 Transmitting unit

#### 3.1.1 Wi-Fi module ESP8266

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any micro controller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi-Fi-ability as a Wi-Fi Shield offers (and that's just out of the box)!. The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community. This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces; it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts. There is an almost limitless fountain of information available for the ESP8266, all of which has been provided by amazing community support. In the *Documents* section below you will find many resources to aid you in using the ESP8266, even instructions on how to transform this module into an IoT solution!

### 3.1 Features:

- 802.11 b/g/n
  - Wi-Fi Direct (P2P), soft-AP
  - Integrated TCP/IP protocol stack
  - STBC, 1×1 MIMO, 2×1 MIMO
  - A-MPDU A-MSDU aggregation 0.4ms guard interval
  - Wakeup and transmit packets in <math>2\text{ms}</math>
  - Standby power consumption of <math>1.0\text{mW}</math> (DTIM3)

### 3.2. Monitoring unit:

#### 3.2.1. Desktop Device

Monitoring unit can be a Desktop Device. This can be including the desktop device as well as mobile device.

#### 3.2.2. Wireless Body Sensor (WBN)

Wireless Body Sensor (WBN) is a wireless network of wearable devices. The WBN field is an interdisciplinary area which could allow inexpensive and uninterrupted health monitoring with real-time updates of medical records through the WiFi. A number of intelligent physiological sensors can be integrated into a wearable wireless body area network, which

can be used for computer-assisted reintegration or early detection of medical conditions. The implanted sensors in the human body will collect various physiological changes in order to monitor the adolescents health status. The information will be transmitted wireless to server. This device will instantly transmit all information to administrator and doctor. If an emergency is detected, the system will immediately inform the parent through the computer system by sending appropriate messages or alarms.

## IV SYSTEM ARCHITECTURE

### 4.1. Server

The server which realized the core algorithm and logical operation is core device. The server handles the data which come from kinds of ports calculates the result and gives response.

### 4.2. Database

The database is used to store a large scale of data which is considered to be a big amount of data. A database of information pertaining to the adolescents, Questionnaires and Recommender in the form of the database.

### 4.3. User

A user is a person who interacts with a system, typically through an interface, to extract some functional benefit. System user also defines the behavior of the system operations and how the audience would interact with the system using pre-designed triggers. In order for the system to work on a larger scale using various databases system would have to create an interface that would be suitable for specific level of knowledge that the end user acquires.

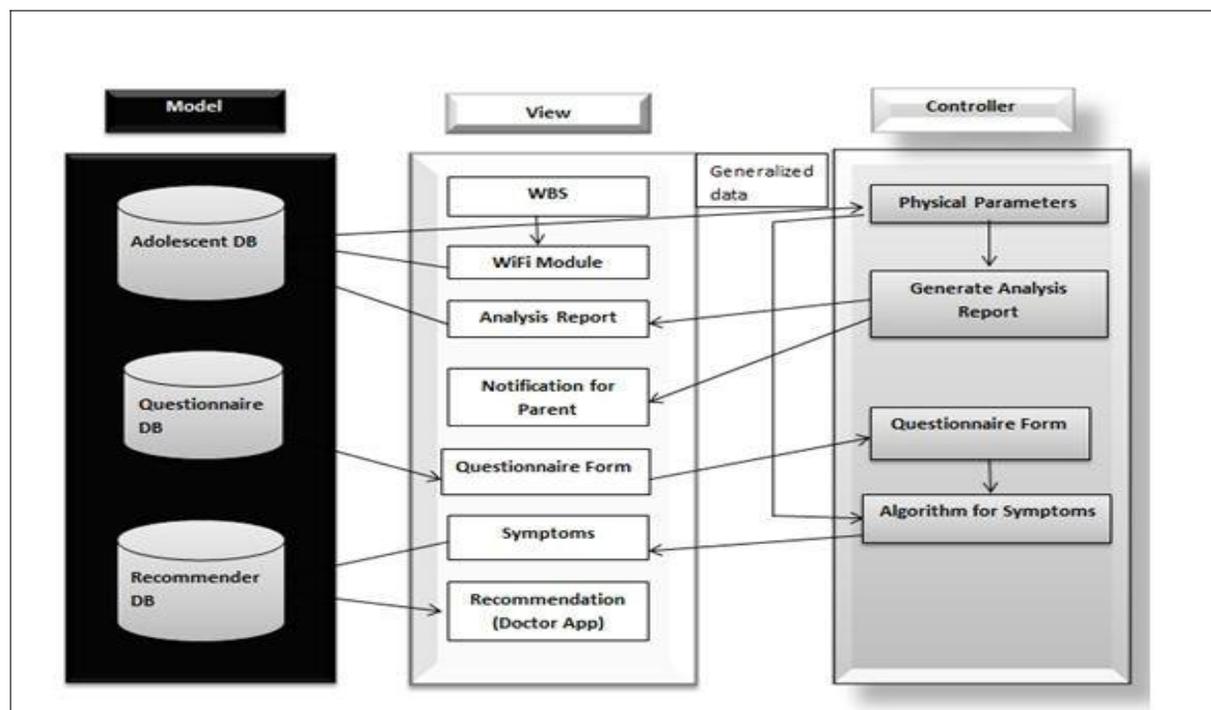


Figure 2: Architecture diagram

## 4.4 Use cases relationship with architecture diagram:

Physiological parameters will be taken from adolescent through Wireless Body Sensor (WBS) and these parameters will be stored on server using Wi-Fi module (ESP8266) which is a part of view in system architecture. System will do processing on stored parameters, generalized data will be taken for generating an analysis report and this analysis report will be shown to administrator as well as to doctor which are the parts of view in system architecture. System contains database as well as server which are a part of model and controller in architecture diagram. System is liable for generating the Analysis report from physiological parameters which is taken from adolescent, sending notification to parent, finding the suitable symptoms of ailment from questionnaire form and physiological parameters and recommending the counsels to doctor.

Administrator of the system is responsible for monitoring health statistics of adolescents and in case of crisis call to doctor which is part of view in architecture diagram. Generated analysis report will be shown to doctor which is a part of view of architecture diagram. As well as doctor is responsible for filling questionnaire form which is present in Questionnaires database, by applying algorithm on physiological parameters and questionnaire form suitable symptoms will be discovered. Depending on symptoms of disease recommendation will be provided to doctor. As like adolescent parent is part of view in system architecture diagram, in case of emergency system will send notification to parent. As shown in fig 2: use case diagram. As shown in fig 3: use case diagram.

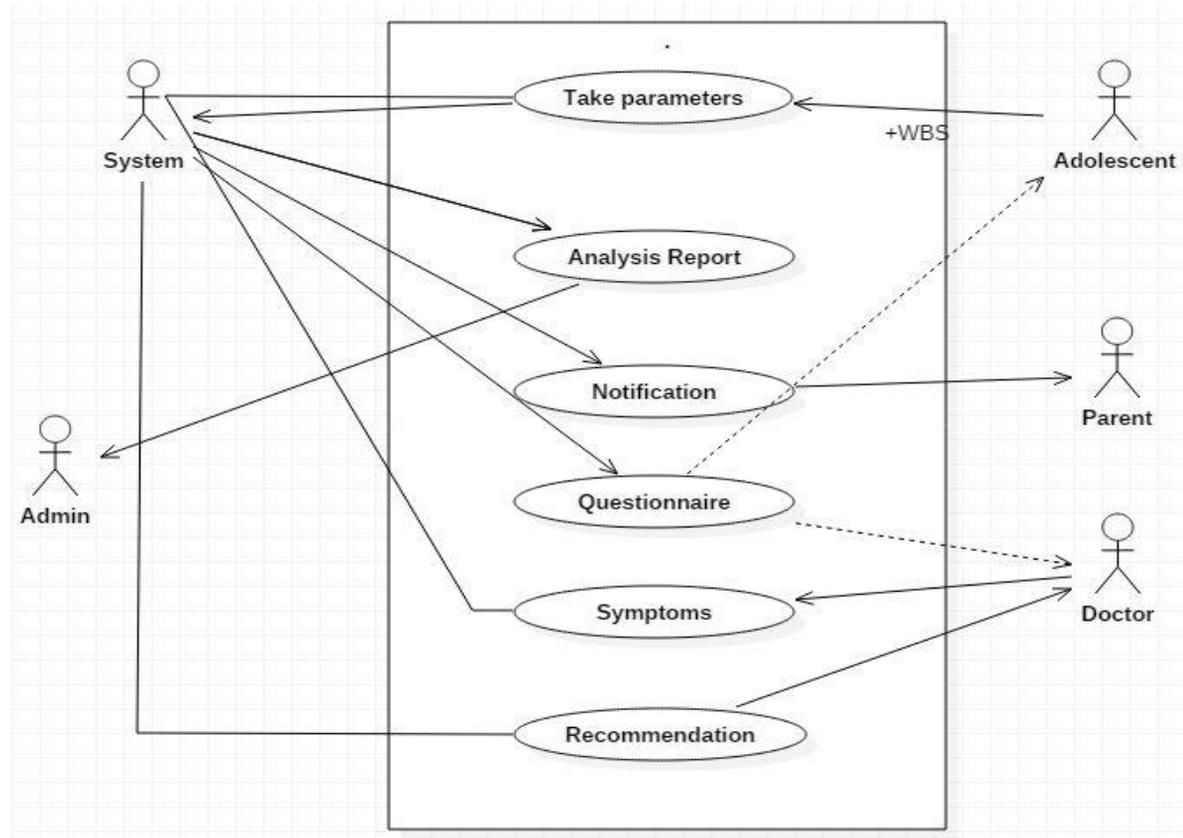


Figure 3: Use case Diagram

Here,

## Adolescent:

Physiological parameters will be taken from adolescent, which is a part of view in system architecture.

## System:

Contains database as well as server which are a part of model and controller in architecture diagram.

## Admin:

Administrator of the system is responsible for monitoring health statistics of adolescents which is part of view in architecture diagram.

## Doctor:

Generated analysis report will be shown to doctor which is a part of view of architecture diagram

## Parent:

Parent is part of view in system architecture diagram, in case of emergency system will send notification to parent.

## V CONCLUSION

An efficient recommender system has been designed in order to provide rubrics to the doctor through bio-sensors. An auto generated analysis report through our system will be available to the doctor along with the rubrics suggested even in his/her absence. The system would be able to analyze the emotional parameters of introvert Adolescent students also which may be extended to all persons in general. Now this system is designed by considering adolescent students only. In the future we can extend it for any age groups.

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## REFERENCES

- [1] Sunil L. Rahane, Prof. Ramesh S. Pawase, *A Healthcare Monitoring System Using Wireless Sensor Network with GSM*, International Journal of Advanced Research in Electrical, Electronics and Instrumentation, Vol. 4, Issue 7, July 2015, pp.63306335, DOI: 10.15662/ijareeie.2015.0407053
- [2] Mara Viqueira Villarejo, Begoa Garca Zapirain et al., *Algorithms Based on CWT and Classifiers to Control Cardiac Alterations and Stress Using an ECG and a SCR*. Sensors 2013, pp 6141-6170; doi:10.3390/s130506141
- [3] Baby shalini T\*, Vanitha L\*\*, *Emotion Detection in Human Beings Using ECG Signals*, International Journal of Engineering Trends and Technology (IJETT)-Volume 4 Issue 5 May 2013, pp.1337-1342.
- [4] G. Shivakumar and P. A. Vijaya, *Emotion Recognition Using Finger Tip Temperature: First Step towards an Automatic System*, International Journal of Computer and Electrical Engineering, Vol. 4, No. 3, June 2012, pp.252-255
- [5] Naazneen M. G., Sumaya Fathima, Syeda Husna Mohammadi et al, *Design and Implementation of ECG Monitoring*

- and Heart Rate Measurement System* , International Journal of Engineering Science and Innovative Technology(IJESIT)Volume2, Issue 3, May 2013 ,pp.456-461
- [6]Bhoomika.B.K,Dr. KNMuralidhara,*Secured Smart Healthcare Monitoring System Based on Iot*,International Journal on Recent and Innovation Trends in Computing and Communication Volume: 3 Issue: 7,pp.4958-4961,
- [7]Madhukar G.N, Karthiyayini J, "*Internet of Things Architecture for Smart Remote Healthcare System*", International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4, Issue 4, April 2016, pp.7243-7247.
- [8] AmnaAbdullah, AsmaIsmael, etal "*REAL TIME WIRELESS HEALTH MONITORING APPLICATION USING MOBILE DEVICES*", International Journal of Computer Networks Communications (IJCNC) Vol.7, No.3, May 2015, pp.13-30
- [9] Prabhakaran R, Jili k p, "*REMOTE HEALTH MONITORING USING INTERNET OF THINGS (IOT)*", International Journal On Engineering Technology and Sciences IJETS , Volume II, Issue IX, September 2015, pp.6-12
- [10] *Secured Smart Healthcare Monitoring System Based on Iot*, Bhoomika.B.K, Dr. K N Muralidhara.
- [11] Changqin Quan, *Sentence Emotion Analysis and Recognition Based on Emotion Words Using Ren-CECs\**, International Journal of Advanced Intelligence Volume 2, Number 1, pp.105-117, July, 2010, pp.105-117
- [12] Albert ode Santos Sierra, Carmen Snchez vila, etal, *A Stress-Detection System Based on Physiological Signals and Fuzzy Logic*, IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, VOL. 58, NO. 10, OCTOBER 2011, pp.4857-4865
- [13] Ginevra Castella no1, Santiago D. et al, *Recognising Human Emotions from Body Movement and Gesture Dynamics*, ACHI 2007, LNCS 4738, pp. 7182, 2007.