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## A WEB BASED SYSTEM FOR BIO-SIGNAL TRANSMISSION

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## ABSTRACT

Telemedicine can make accessible the benefits of new technology, largely in the field of information and communications, in providing medical care. Telemedicine has reduced the human effort by replacing wired infrastructure with wireless infrastructure. In this paper we investigate the remote monitoring system for bio-signal transmission. In this paper we present low cost, web based system for transmission of various bio-signal, so that bio-signal acquired from the sensors can be transmitted from phone to the wed server, so that doctor can analyses the signal of their patient and give advice about their health, it is like regular monitoring of patient.

**KEYWORDS**: Bio-signals, wireless, Android OS, Eclipse.

## INTRODUCTION

At present heat diseases, blood pressure is the serious diseases that may threaten human life. Major advances in the field of mobile communication have lead to deployment packet data services over cellular mobile system which support for the development of new application.

The aim of this technology is to reduce the number of cables and wires which may be tedious and often even hazardous.

The tele-transmitting and receiving of bio-signal is beneficial for the remote monitoring of patient. Tele-monitoring is a medical practice that involves remotely monitoring of patients who are not at the same location as the health care provider. Telemonitoring provide huge financial advantages as well as give freedom of staying home and live normal life with their family. Rural hospitals with limited resources benefit from Tele-monitoring service if that hospital is connected with major advance hospital in metropolitan areas. In 1996, researchers at the National Technical University of Athens have successfully demonstrated [1] real-time transmission of ECG data from a moving ambulance vehicle using GSM data links.

Wireless tools [2] have been replace cables and allowing increased patient mobility for decades through patient monitors. The wireless mobile healthcare system is a bendable system, that allow users real-time monitor of biological signals and transmits the results to the hospital central by mobile wireless communication device. As the advancement in wireless sensor technology made remote monitoring easier, the number of smart phone applications utilizing this opportunity has become increasing. As a result it is now more common to see Mobile based wireless health monitoring devices or remote control apps in our daily life.

The Android platform as part of the most widely used operating systems on smart phones and hand held tablet devices is important target for mobile application developers. The biggest market share and wide popularity of the android OS makes the platform the best choice from business and research perspectives

In this project we are going to acquire the various bio-signals by using various sensors and these acquire signals are transmitted to android application via Bluetooth and then the signals will transmitted to the web server by the android application so that doctor can visualize the signal at its website at any time any place it is like a routine checkup of

patient, and if the signal are not proper then a massage   will also send to doctor as well as one of family member of patient, so that doctor can analyses the signal of their  patient and give advice about his/her  health.

## Methodology



*Fig: 1*

**HTP Monitor**
HTR monitor is a hardware device which contain different sensor like pulse rate monitoring, temperature sensor, posture sensor, Slight fluctuation in the normal heart rate , body temperature and change in body position of patient will be sensed by the heart sensor , temperature sensor and posture detector respectively, and all these sensors are connected to a microcontroller and transmitted to a android application via Bluetooth module so that it would be send to web server via android app, and if  parameters are not proper than message will be send to doctor. Block diagram for entire architecture of "A Web Based system for bio-signal transmission" is shown below. It contain three sensors, microcontroller, Bluetooth module, android app and web site.
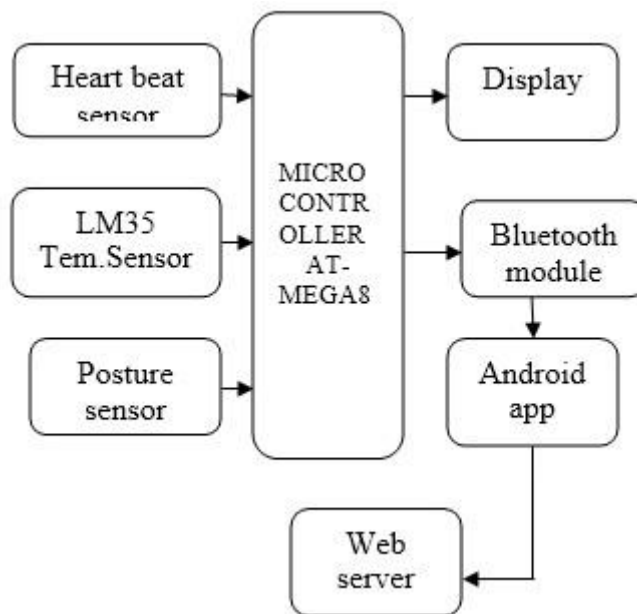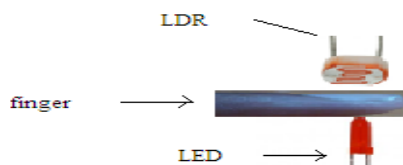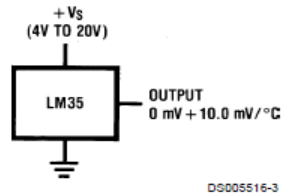


*Fig: 2*

*Heart beat sensor:*



*Fig: 3*

It contains LDR and LED, finger is placed between LED and LDR and the heart beats are measure using heart beat sensor [15]. The normal resting adult human heart rate ranges from 60–100 bpm. Below 60 bpm chances of Bradycardia. Above 100 bpm Tachycardia.

*Temperature sensor:*



FIGURE 1. Basic Centigrade Temperature Sensor
(+2°C to +150°C)

*Fig: 4*

The LM35 is integrated-circuit temperature   sensors, whose output voltage is linearly proportional   to the Celsius (Centigrade) temperature. In this project it is use to calculate the body temperature of patient in centigrade its range is 20 C to 1500C.[15]

*Posture sensor:*
It is used to analyse the position of patient that is the patient is in the sleeping position or seating or standing position.[15]

*Bluetooth Module:*
Bluetooth module use here is HC 05, it is connected to the microcontroller to receive signals from various sensors and transmits that signal to android app so that these signals are send to web server and doctor can monitor the patient. To transmit signal to android we have to first pair HC 05 with Bluetooth of phone to with which our hardware device we want to be connect.

**Development of Android Application**
Android [6] is a Linux based operating system that is builds for smart phone and tablet devices. It is an open source OS. One of the merits of developing for android is the cheap and easiness of the development environment. The Android software development kit [SDK] and tools are provided free of charge from the developer's site (http://developer.android.com). In addition to this, well organized documentations make it easy for developers to start up and dive in to the platform quickly. While developing android applications, Tools from the SDK [5] can be invoked through command Line or the ADT.

In this project, the Eclipse [4] IDE is used for the application development .The ADT (Android Development Tools) is Eclipse plug-in that is recommended for developing android applications since it offers direct invoking of tools during application development. Android applications are written in the Java language, compiled into byte codes which will be converted to a .dex file (Dalvik executable file) using the dx converter. This will further be com-piled in to android package file (apk file), that can be installed on the android devices the application will work as shown in the following diagram

*Eclipse:*
Eclipse is an integrated development environment (IDE). It contains a base workspace and an extensible plug-in system for customizing the environment. Written mostly in java, Eclipse can be used to develop applications. The Eclipse Web Tools Platform (WTP) project is an extension of the Eclipse platform with tools for developing Web and Java EE applications. It includes source and graphical editors for a variety of languages, wizards and built-in applications to simplify development, and tools and APIs to support deploying, running, and testing apps.For many

Java developers, Eclipse (IDE) is a choice. Commonly cited reasons for using Eclipse comprise rich Java Development Tools (JDT) support and a plug-in architecture that allows tight integration of third-party functionality. An Android project contains all the files that comprise the source code for your Android app. The Android SDK tools [14] make it easy to start a new Android project with a set of default project directories and files. Figure 4 shows the Eclipse development environment, which is used for display and manipulating information in views.
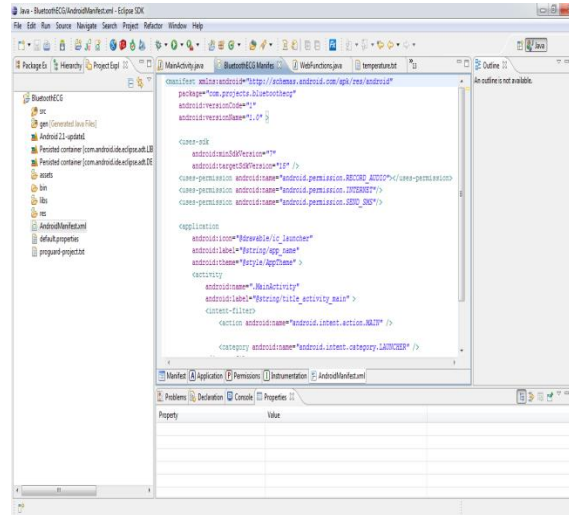


*Fig: 5*

### Stapes for developing android application
Steps for Android application in Eclipse IDE using the ADT plug-in and run it with an Android Virtual Device are as follows.

Android applications are primarily written in the Java programming language in eclipse software. The Java source files are converted to Java class files by the Java compiler. The Android SDK contains a tool called dx which converts Java class files into a .dex (Dalvik Executable) file. The .dex file and the resources of an Android project, like images and XML files. They are packed into an .apk (Android Package) file. So finally whole Android application (.apk file) will be created and deployed

Download and Install the Android SDK
Download and Install the ADT Eclipse plug-in
Create an Android Virtual Device (AVD)
Create an Android Project with Eclipse
Run the Application in the Android Virtual Device And it generate apk file install the file in mobile phone.
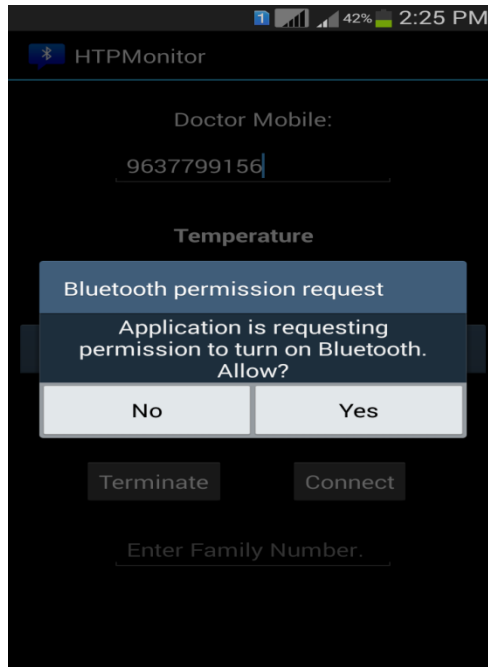It check for Bluetooth permission  as

*Fig: 6*

After establishing the Bluetooth connection the HTP monitor is now connected to the android application. And it can now receive the signals from HTP monitor and send the signal to doctor's web site like routine monitoring.
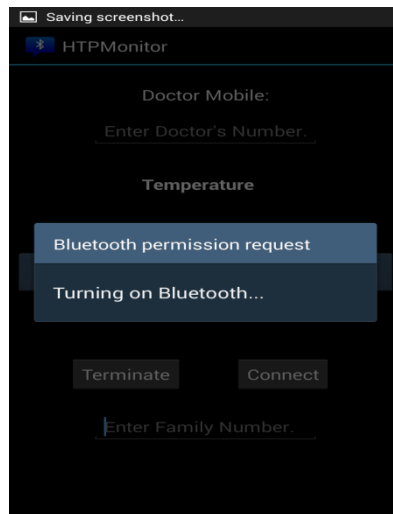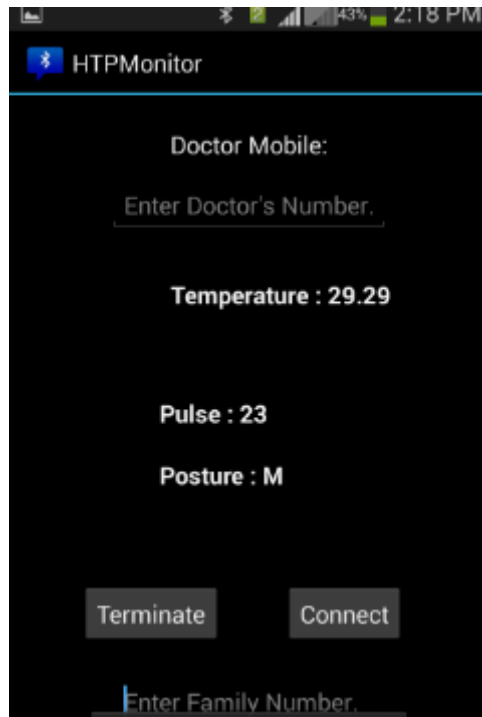


*Fig: 6*

*Fig: 7*

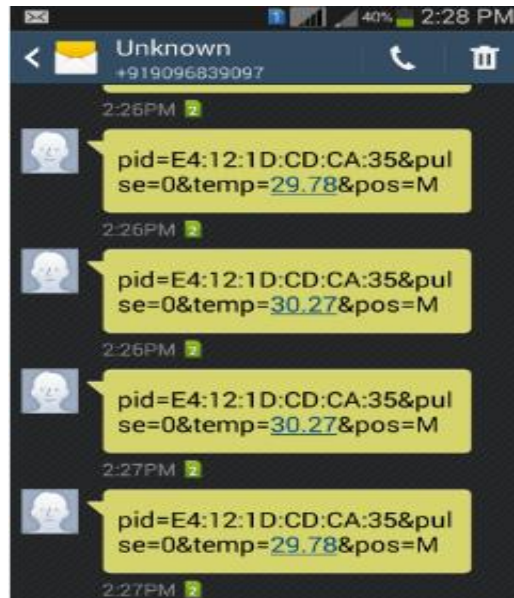As in above result the pulse rate is not less hence message send to doctor as per our signals.



*Fig: 8*

***Online to Doctors account:***
Once the signals are received on android app it sends the signals to web server where doctor can visualize the signals as a routine monitoring of patient. The app also compare the signals with some stander threshold value and if the signals are above or below that value than the message will send to doctors mobile as check the details of your patient because some of his/her signals are not proper. The online signals are shown bellow

*Fig: 9*

## RESULT

In this paper we got the results for creation of android application that will able to transmit the various biomedical signals to the web server. We can connect bio-medical sensors to our phone via Bluetooth module, and also send message to doctor as well as one of the family member.

## CONCLUSION

We have developed a portable medical device to be used for routine monitoring applications. The device uses android mobile telephony links and allows the collection and transmission of vital bio-signals to the web site and also send message for abnormal signals.

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