A System For Bio-signal Transmission

Miss. Priyanka R. Jadhav
M.E.Student,Branch-DigitalElectronics,
Department of Electronics and Tele-communication,Shri Sant Gajanan Maharaja College of Engineering,Shegaon,S.G.B.Amravati University(Maharashtra State),India.

Prof. V. M. Umale
Associate Professor
Department of Electronics and Tele-communication Shri Sant Gajanan Maharaja College of Engineering Shegaon,S.G.B.Amravati University(Maharashtra State),India.

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.

Keyword: Biosignal, Android OS, Eclipse, wireless, PHP

I. 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 patient 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 Electrocardiograph (ECG) applications that work with 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 portable medical devices and this devices are connected to the patients mobile phone, we create an android application in our mobile phone so that the various bio-signals that are connected to the mobile phone are transmitted from phone to the web server and doctor can analyze that signal on web server, also the massage is send to the specialized doctor as well as one of the family member of that patient if the Signals are not proper. In this paper we show the development of android application for patient mobile.

II. BIOLOGICAL SIGNAL

Electrocardiogram [ECG]

Electrocardiogram gives the electrical activity of the heart, ECG is the graphic record of the heart's electrical activity which used in the investigation of heart disease. An ECG is used to measure the heart's electrical conduction system. It picks up electrical impulses generated by the polarization and depolarization of cardiac tissue and translates into a waveform. The waveform is then used to measure the rate and regularity of heartbeats,
Figure bellow shows the basic waveform of ECG.

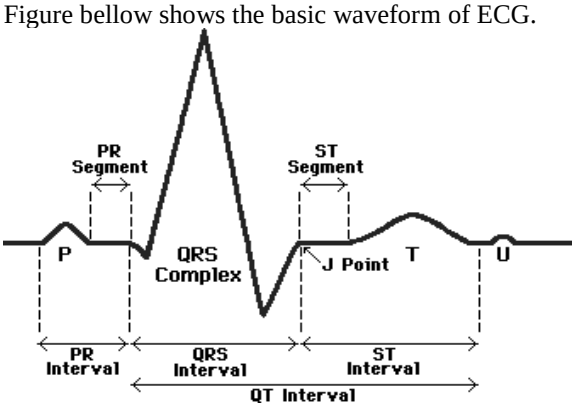

Figure: 1

Blood pressure

Blood pressure (BP), sometimes referred to as arterial blood pressure, is the pressure exerted by circulating blood upon the walls of blood vessels, during each heartbeat blood pressure varies between a maximum (systolic) and a minimum (diastolic) pressure
A person's blood pressure is usually expressed in terms of the systolic pressure over diastolic pressure and is measured in millimeters of mercury (mmHg), for example 120/80. This is a normal range of blood pressure. High blood pressure causes may heart problem.

III. Methodology

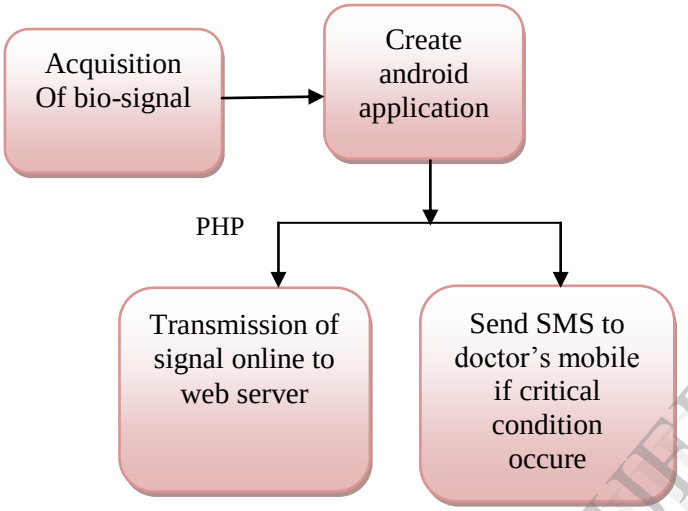

Figure: 2

Android OS

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.

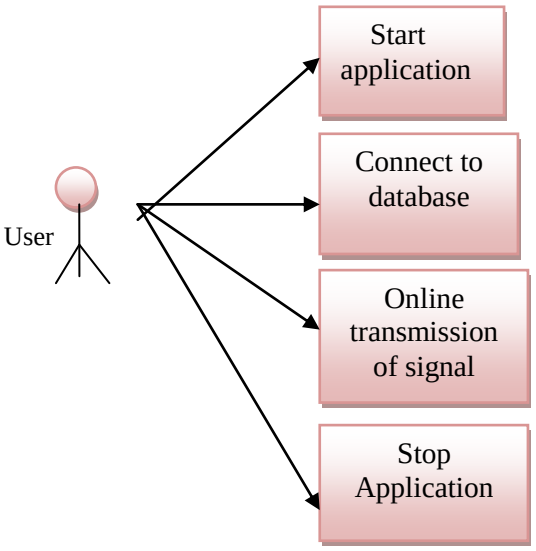

Figure: 3

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 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.

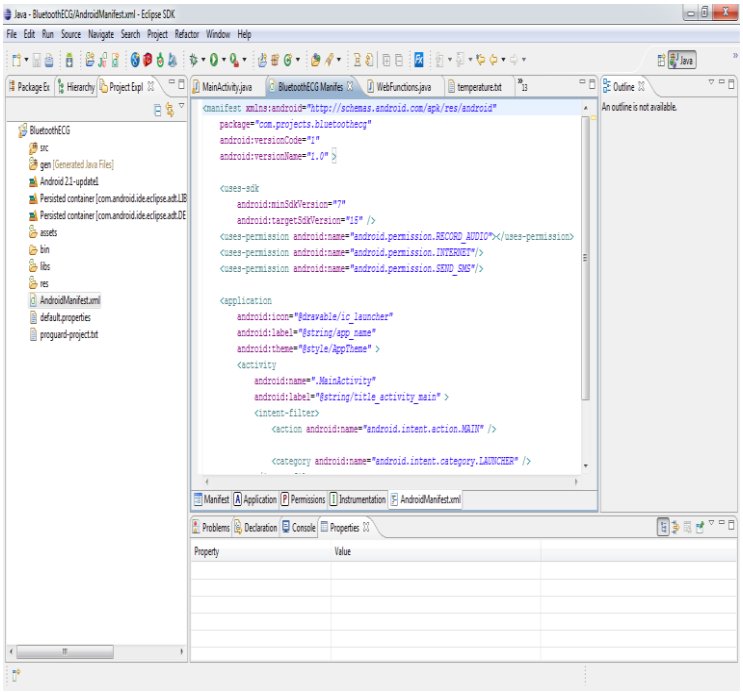

Figure: 4

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

1. Download and Install the Android SDK
2. Download and Install the ADT Eclipse plug-in
3. Create an Android Virtual Device (AVD)
4. Create an Android Project with Eclipse
5. Run the Application in the Android Virtual Device

IV. 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, for this paper we create database for various biomedical signals as a input for application to run.

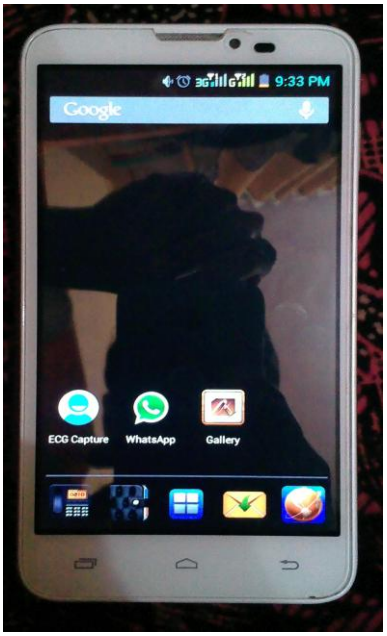

Figure: 5
The application looks like this on the screen

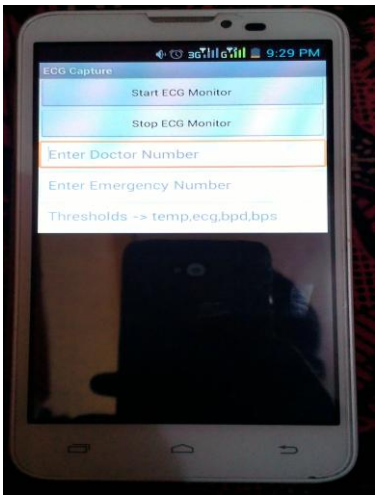

Figure: 6
The application will work like above

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