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Automated Oxygen Level and Blood Pressure Sensing Using Embedded System

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Abstract: Blood pressure and the oxygen related problem has become more critical. So we are implementing an automated oxygen and blood pressure sensing system. The blood pressure sensing system will give the diastolic and systolic pressure reading on the display. In the oxygen sensing system the concentration of oxygen is evaluated in both breath in and breath out air in non-invasive manner in which the luminescence is generated by the oxygen sensitive luminophore. It directly depends on the concentration of the surrounding oxygen. The output of the two systems is received on the smart phone via Bluetooth. The system can prove to be quite handy for the doctor as it will help in minimizing their work. This is a wearable and an easy device. It is a combination of software and hardware. This android app is developed for the data visualisation. It is useful in the diseases like Asthma, Hypoxia, Brain hypoxia hyper tension etc.

Keyword: Blood pressure, Oxygen, Android App, Blood pressure sensor, Oxygen sensor, Bluetooth, Asthma, Hypertension, Brain Hypoxia etc.

I. INTRODUCTION

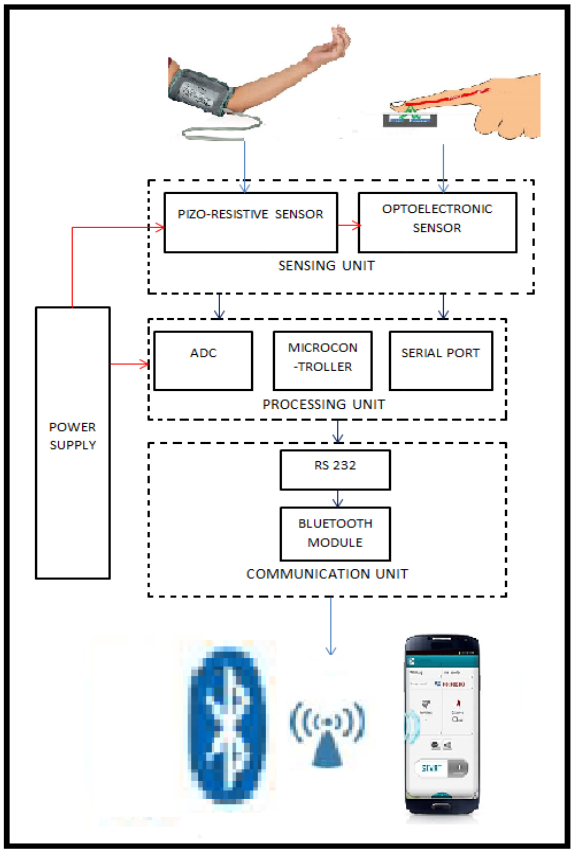
In the 21th century, human being is so much busy in work due to this busy life human suffers from so many disease but the percentages of blood pressure and oxygen related problem is more. When your heart Brats pumps, blood flow from your body for that oxygen and energy is needed the force and strength of pushing, is called blood pressure**.** In simple way, pressure created by the blood in whole body is blood pressure**.** In world, 90% humans are suffering from Blood pressure .Blood pressure is measure in mmHg (millimetres of mercury). Blood pressure can be high, normal, low. The normal blood pressure is 120/80. There are two reading in the blood pressure – systolic and diastolic**.** In normal human being, 120 is systolic blood pressure reading and 80 is diastolic pressure reading. There are so many allotropes of oxygen. But human required gaseous oxygen O_2, blood carry the oxygen from lung to whole body parts, which is oxygenated blood and Deoxygenated blood is carry impure blood from body to lung. For the Energy and metabolism, oxygen is converted in ATP and stored in mitochondria. So oxygen is importunate for the human body. Normal oxygen level in human is 90-100 % below 90 % causes hypoxia.

In India, there are about 15-20 million people suffering asthma out of which there about 1.8 Million visit to the emergency section of asthma departments in the hospitals. In which about succumb to death [6], hence it is top most priority to take proper care and medications to avoid asthma. [6]

There are various issues related to health and one of them is blood pressure. Blood pressure problems can happen due to various reasons namely hypertension. Study says that with increase in altitude the blood pressure also increases. The altitude plays an important role. [2]

Previously many devices were designed which measured blood pressure and oxygen separately like the traditional mercury sphygmomanometer for measuring the blood pressure and spirometer for measuring oxygen [1].

II. BLOCK DIAGRAM



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In this project we have given 5V powerr supply to the blood pressure sensor and a 3.3V power supply to the oxygen and the pulse sensor. In this we have also used a signal conditioning so as to get a proper voltage at the micro-controller. The outputof the signal conditioning is given to ADC which is in built in the microcontroller.

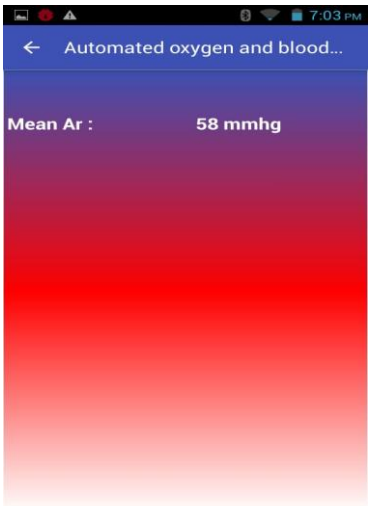
In this we used Optoelectronic sensor (saturation of peripheral oxygen). The optoelectronic sensor has a LED and a phototransistor , and the LED used here is a red LED. The wavelength of red light is 780nm to 622nm. The intensity of light is dependent on the concentration of oxygen present in the body.

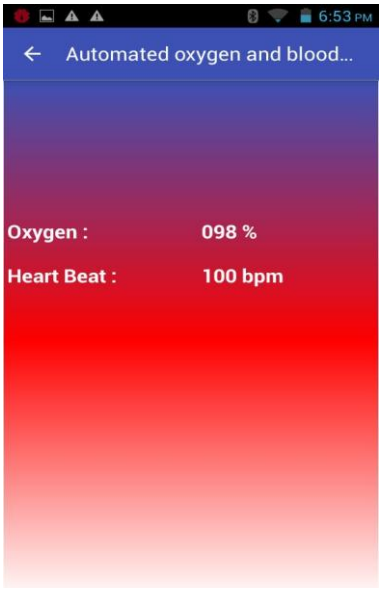
Therefore it is possible to find out the oxygen concentration. Red light becomes more sensitive when finger is placed on the sensor in between the LED and the photodiode.the difference between light wave passing through the finger gives the value of oxygen measurement. This value represented in the form of percentage(%). Red blood is made up of 98% oxygenated haemoglobin and 2% non-oxygenated haemoglobin. The bond between oxygen and Fe(iron) is Fe=O and the angle between Fe and O_2 is 120^0.

The method that we have used is non-invasive method for measuring blood pressure. The cuff starts inflating due to the applied presure when the cuff is inflatd enough so as to stop the flow of blood. The cuff is then slowly deflated. For a normal person the pressure reading occur between 90-120 mmHg. The systolic pressure is noted wh++en the first occurance of the rythmic sound is heard then the blood begins to flow through the artery, the sound heard is similar to that of the tapping sound. The diastollic reading is noted when the pressure starts dropping and the sound begins to fade.

The blutooth is used to send data from the deviceto our smartpones. Blutooth proves to be a convinient wireless technology

III. RESULT





This is a system which measures blood pressure and oxygen level simultaneously in the automated system using embedded system. The output of the system is received on the smartphones via bluetooth, on the screen we will be able to see the high and low bood pressure readings and also the oxygen level in the human body This system is combination of software and hardware. The method we have used is a non-invasive method of measuring the bood pressure and the oxygen level.

IV. CONCLUSION

This system very handy and can be carried from place to lace easily. This system very convinient for the people from asthama, Hypertension, Brain Hypoxia. It is highly advisable for people suffering from blood pressure so as to keep a constant check on the BP level. This system has various advantages like the physical presence of doctor is not necessary, no need of training to operate the system; it is considered to be very convenient for continuous monitoring of health. The oxygen sensor is quite convenient and easy to use.

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