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INTERNET CONNECTED PATIENT HEALTHCARE MONITORING IN SMART PHONES

[1]K.B.Sai Aravind, [2]DR.J.Mohana

Abstract-- *Life expectancy has improved significantly in the past three decades thanks to major developments in scientific research and development, food and diet, healthcare and environmental and personal health consciousness. As a consequence, the population growth in several countries is projected to increase exponentially over the coming years. Fast-growing numbers on the elderly are projected to have a detrimental effect on many countries' socio-economic policies in terms of the expenses associated with their wellbeing and wellness. Additionally, neurological, hair, digestive, skin, and mental wellbeing associated illnesses are common across the globe. Most of such diseases may, however, be prevented and/or controlled adequately by continuous surveillance. Implementing continuous health surveillance and serving evolving health needs; It is critical to introduce effective, intrusive and easy-to-use healthcare solutions. The ongoing prevalence of smart phones coupled with integrated sensors and sophisticated networking technologies allows it an enticing resource for ongoing and remote monitoring of human health and well-being. Within this article, we offer a thorough overview of advanced work and advances within smartphone-sensor-based safety technology. Analysis of legislative strategies for medical devices and their consequences for smartphone-based healthcare networks is discussed.*

Keywords-- *Port forward, healthcare services, monitoring, heart disease, tele health.*

I INTRODUCTION

With the passing of time, more and more innovations are incorporated into human life [1]. As other technical developments in the field, it is primarily used in the field of medicine and in disease diagnosis [2]. This advancement gives rise to groundbreaking methods that meet all the needs of medical practitioners and patients [3-5]. In the conventional approach, for the illness to be treated, patients had to stay in the hospital again. But now, due to technical advancements, the patient's health can be tracked and the disease diagnosed with the help of doctors [6-9]. Several tools are readily available to obtain various essential body parameters, such as random blood sugar, blood pressure and pulse rate [10]. Both these storage facilities help patients feel more at home than in hospital. That can be regarded as a personalized approach. It guarantees safe and secure healthcare at all times [11].

[1] *Department of Electronics and Communication Engineering, Saveetha School of Engineering, SIMATS, Chennai - 602105, India, Email: Saiaravind701@gmail.com*

[2] *Department of Electronics and Communication Engineering, Saveetha School of Engineering, SIMATS, Chennai - 602105, India, Email: mohana@saveetha.com*

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India is the seventh largest nation in the world governed by a single body comprising 29 states and seven union territories covering an area of about 32 km2. Proper and adequate healthcare for rural and remote communities in India is a challenge for healthcare sector in the region. Also today, 75 percent of medical practitioners practice better healthcare in urban areas, while the weak rural health system affects 70 percent of India's population.

Monitoring of electronics-health (e-health) patients is a significant advance in research [12][13]. In terms of functionality it can get really costly. To mitigate this situation, we define the design of an advanced / high-performance LBC-218 microcontroller-based integrated portable health monitoring system [14-15].

II PROPOSED SYSTEM

In this proposed system we are implementing an E-health monitoring system by using the camera module we are monitoring live health of the patient using IoT application. By using bio sensor we can sense the data's of the human body and the same time the heartbeat of the person can also be monitored. And then the mems sensor is used to find the patient position. From both sensors input if a person gets abnormality temperature or heart rate, immediately Arduino sent the alert message will accumulate through GSM. In this system we are implementing the live monitoring of patient for additional security. We can able to monitor the patient live monitoring is very helpful to doctor for caring of patient. So we are set the static IP to the Raspberry pi and then port forward configuring done through the router. Now we can monitor the patient heartbeat, temperature, position of patient and humidity of environment in IoT application and also patient live streaming can be look up into internet browser using the Raspberry pi.

III BLOCK DIAGRAM

Entire sensor connected to controller as proposed pins. System design shows Fig 1.

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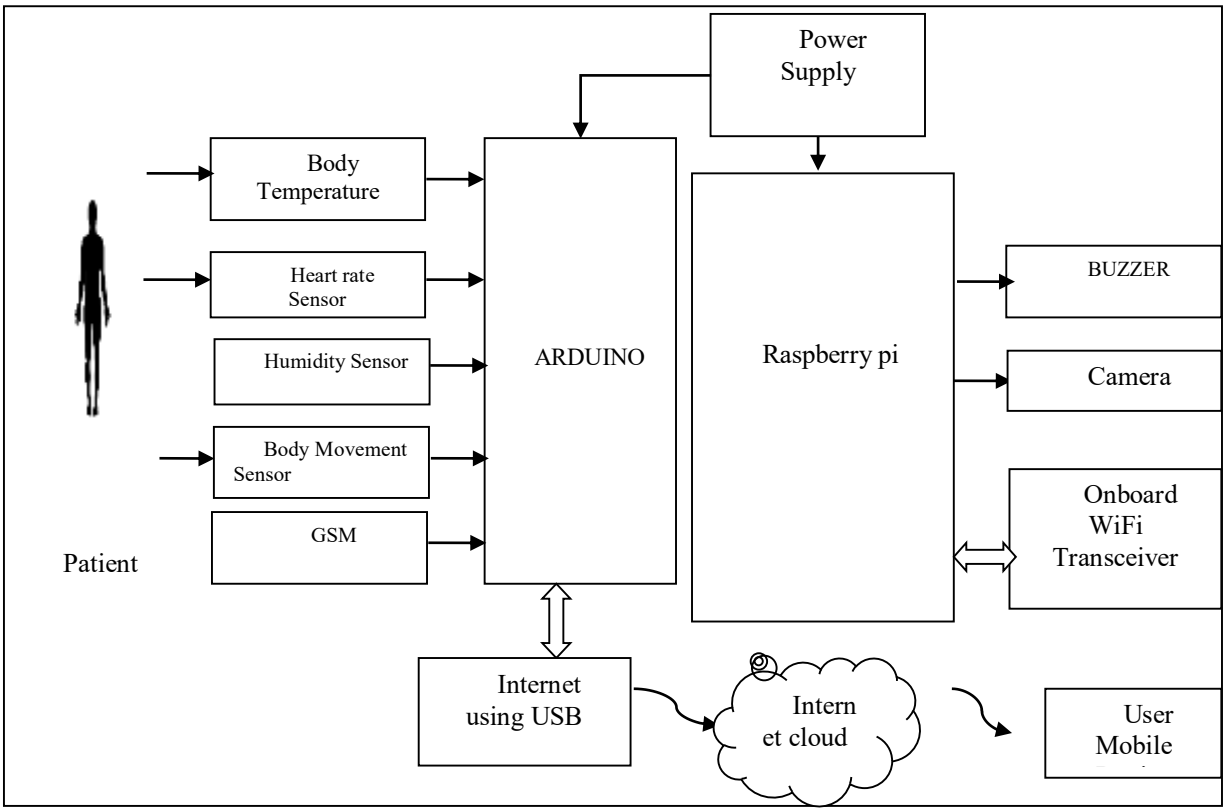

Figure 1: Image of system block diagram

RASPBERRY PI:

It is the newest network line to offer 1.4GHz, 2.4GHz dual-and 5GHz wireless LAN, 4.2/PLE Bluetooth, Quick Ethernet and BoE with a different PoE mask. The band arrives with Wireless LAN Universal Implementation Certificates and becomes a completed product with a substantial reduction in the tracking of wireless LAN regulations.

ARDUINO:

It is open source, and Arduino Uno is using a wide open source microcontroller package, based on the ATmega 328p Microchip. This group contains a mix of digital and analog input / output pins (I / O) that can be connected to various boards for extension and other circuits. The community is comprised of 14 optical pins and six analog pins. 5 volt, 7 to 20 volt input voltage, 16 MHz clock speed, 32 GB flash memory, 2 KB SRAM and 1 KB EEPROM

HEART BEAT SENSOR:

LED and a detector such as a light detector resistor or a photodiode are integrated on the standard heart rate monitor. Pulses of the heart rate enable the blood supply to different areas of the body. This absorbs (a finger membrane) or transmits light (ear tube) as a membrane is illuminated by a light source, that is, the light produced from the eye. Some light is consumed and distributed by the body, or light is provided by the light detector. The sum of light that is consumed depends on how much oxygen there is in certain tissues. The output of the detector is in the form of an electrical pulse and is proportional to the heart rhythm.

MEMS SENSOR:

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MEMS comprises of components varying from 1 to 100 meters and MEMS systems usually vary from 20 mm to 1 mm, while components can reach 1000 mm2 in arrays.

GSM:

GSM / GPRS Modem-RS 232 Dual Band GSM / GPRS System-Designed with SIM 900A. The modem comes with the RS232 module that links the PC and microcontroller to the RS232 processor. The modem is fitted with an internal stack for connecting through GPRS. External managed power lets you link a broad range of unregulated electricity.

BUZZER:

This can be done with a 4V to 9V DC-powered buzzer. You may also use a basic 9V battery but a controlled + 5V or + 6V DC supply is preferred. Normally the buzzer is connected with a switch circuit which needs space to turn on or off the buzzer when required.

HUMIDITY SENSOR:

The moisture sensor (or hygrometer) detects, monitors, and records humidity and temperature of the air. The relative humidity level of the maximum sum of humidity in the air at a specified air temperature is called relative humidity. When looking for warmth the relative humidity is an significant consideration. Moisture sensors operate by detecting variations in electric currents or shifts in air temperature

TEMPERATURE SENSOR:

In industrial process systems or laboratory settings, the most commonly measured physical parameter is the temperature. Proper measurements are a major part of the success and certain tasks involve precise measurements, such as scientific trials, experimental materials research, computer or electrical system research, biological studies, and geological analyses. Temperature sensors are more commonly found in circuits powered by various instruments for controlling the temperature.

CAMERA MODULE:

The USB Camera Module is a small lightweight camera that supports the Raspberry Pi. It communicates with the Pi using the USB interface protocol. It is commonly used in image processing, machine learning or observation projects. This is commonly used in surveillance drones because the camera's payload is so low.

OS INSTALL PROCEDURE:

Step 1: Download the Required Software and Files

Step 2: Get the SD Card and the Card Reader

Step 3: Check the Drive in Which the SD Card Is Mounted

Step 4: Format the SD Card

Step 5: Write the OS on the SD Card

Step 6: Eject the SD Card

OS UPDATE PROCEDURE:

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Step 1: sudo apt-get update

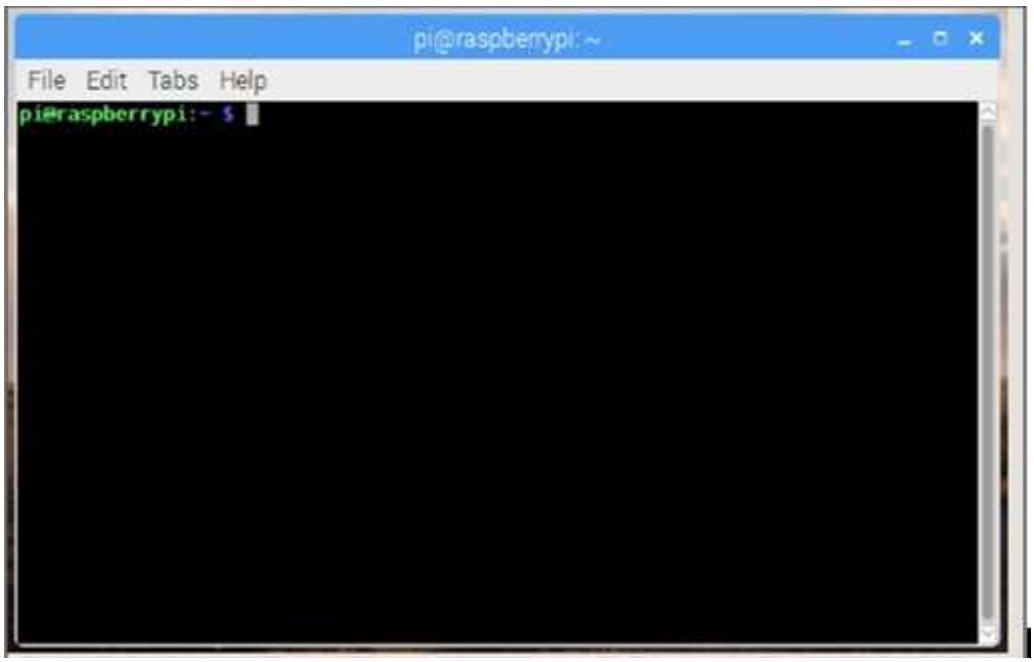

Figure 2: Home screen of pi

Step 2: sudo apt-get upgrade

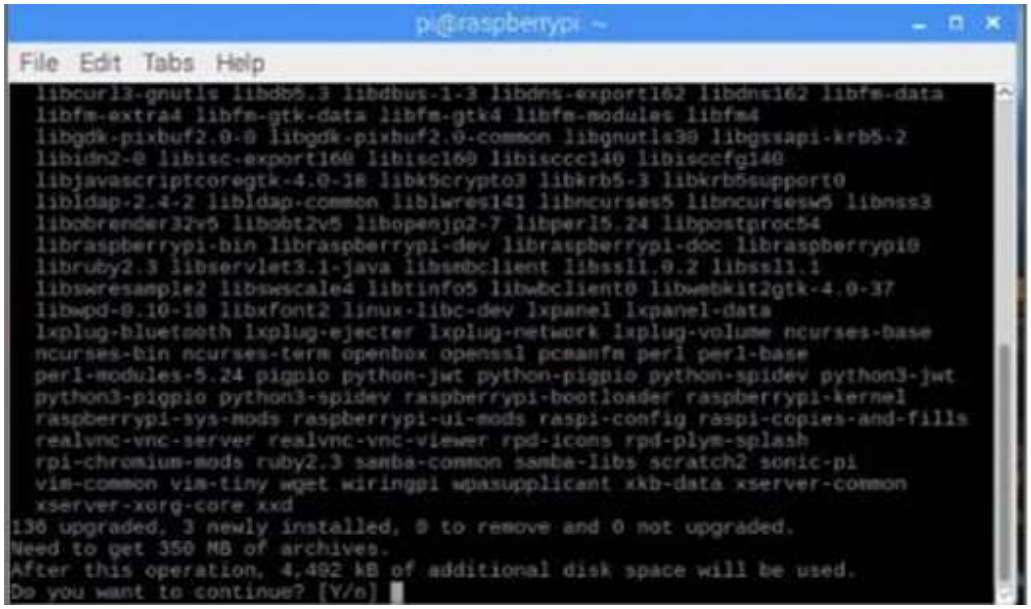

Figure 3: Update procedure

Step 3: sudo apt-get install motion

Step 4: sudo nano /etc/motion/motion.conf

- daemon on
- width 1280
- height 720
- framerate 2
- pre_capture 2

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- post_capture 2
- stream_localhost off
- sudo reboot

Step 5: sudo nano /etc/default/motion

start_motion_daemon=yes

Step 6: sudo reboot

IV RESULTS AND DISCUSSIONS

The entire sensors are connected to Arduino with respect to Fig 1. In this system we propose all the data's are monitor through the mobile so we used the IoT cloud application for live monitoring. We need to monitor the live monitoring of data we need to ensure the net connection to Arduino so USB via internet sharing technique used this system. Finally the system conducted the test and proposed output get. Output images of the system shows in Fig 4. Temperature sensor, mems sensor are gives the analog output so that's sensor are connected to Arduino with respect to A1, A2. Heart beat sensor gives digital output so it's connected to digital pin 8. GSM modem have TX,RX but in this system USB internet connection using Hardware serial port so we are connected to GSM modem connected to software serial port with respect to 9 and 10. Raspberry pi has in build Wi-Fi so no need TX and RX and has USB port. Camera connected to raspberry USB port.

Figure 4: Live output of system

V CONCLUSION

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It's a compact health monitoring device that will use sensor data to go home as the primary information for the patient before seeing the doctor. We are adding a smart phone mobile app to receive data's and make recommendations on body health. Not only does this approach supplement the practical implementation but it also supports the advancement of wireless medical systems. For remote areas to the network is important. With the introduction of similar devices, such as tracking, various criteria in home health tracking could be enhanced for future purposes.

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