

HEALTH MONITORING BAND

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ABSTRACT

We all are aware of the saying that 'HEALTH IS WEALTH'. knowingly or unknowingly lots of people are messing up with their health, risking their lives. Pollution, unhealthy lifestyle has been influencing bad health. Here most the problems caused by such is internal. Those problems generally shows the symptoms like increase in body temperature, increase in heart beats, etc. which can be easily measured. Our project 'Health monitoring band' uses sensors to sense the change in heartbeat, body temperature and sends it to the Arduino. Here, Arduino evaluates the result and displays it to the led screen on the band. Similarly if in emergency condition, the responsible person automatically receives the voice message or the text message about the health condition of the band user.

KEYWORDS: ATMEGA 328, pulse sensor, heat sensor(LM35), OLED, bluetooth (HC 05).

INTRODUCTION

Health monitoring band have drawn a lot of attention from the research community during last decade as it pointed out by a numerous and yearly increasing corresponding development effort.[2]As health care cost are increasing there is increasing demand of health tracking system to increase and maintain consumer's good health .Over the decade now, various health band are commercially produced which aimed for the real time feedback on one's health condition .Health monitoring system has been means of addressing the issues of elderly people rehabilitation consumers. Health monitoring band is a wearable device which uses pulse sensor and temperature sensor. Pulse sensor and temperature sensor are

placed at back of the health monitoring band which enable user to measure their heart rate and check temperature of users body. Health monitoring band feature oled display in which time, date and day is set as default screen. Buzzer and RTC are used. RTC is used in displaying time. Bluetooth module is used to connect with mobile device .AT-mega328p microcontroller is used to control all the devices.

Health monitoring band features medicine reminder which is used for user to set reminder for their medicine taking time.

Literature Review

The problem of the physiological diseases is mostly seen in south Asia and exceeds the global increases this condition. NCD diseases have been emerging as leading causes of death as individuals also exposing individual to risk factor [3].

Some pupil need to take daily dose of the medicine e.g. medicine in high B.P. also some pupil pulse should be measured every day to prevent from heart attack as pulse will be of abnormal value when he suffered from heart attack. These type of work might be forgotten sometime which leads to be the victim of physiological diseases [4]. Such problem can be overcome if there is daily wearable things like watch, band or bracelet which as act the home nurse.

Health monitoring band is daily wearable band for the human which is analogous to the smart watch but mainly focus in health function. It measure the human pulse, body temperature ,the function of time remainder for medicine, the band also show date, time and day also some band show the oxygen level and blood pressure too[5] .The special features of this band is it is economical band, accuracy in measurement, wearable at any time.

AT mega 328 is the heart of the band which is programmed through Arduino UNO. The pulse sensor is used to measure the pulse of human. It is well designed plug and play heart rate sensor for the Arduino it clips onto a fingertip and plugs into the chip and LM35 is used measure the human temperature. Its range is (-55⁰ C- 150⁰ C), its output voltage varies by 10 mv in every degree rise in temperature [6].

RTC is used for watch feature as it tracks the current time and it can be used in order to program actions at certain time.to keep it running the board is powered through Li battery[7] .Buzzer is used as alarm purpose in time remainder feature.

Bluetooth model is also added in the band which play role in connection with the mobile application. The application is made through MIT app inventor.The feature of application is to call another person if user have abnormal pulses. The number is saved by user in application . This is the one of the finest features of the band.

METHODOLOGY

Health monitoring band works on +5v power which is provided with the help of voltage regulated power supply from li-on batteries.Two 3.7v li-on batteries in series gave output to 7.4v which was converted to +5v by 7805 voltage regulator.With the help of menu button in the circuit,user can select whether to check pulse,bodytemperature,set date ,time or set reminder for medicine alert.

When the device is on,there appears a screen with time,date and menu as aoption.Due to the RTC module, time doesn't need to be updated again and again.When we press menu button from circuit,we can see the features of health band and for navigating those options,up down and select buttons are separated in the circuit.As per the need of the functions,delays are inserted for measuring heart beat or body temperature.When mobile is connected via Bluetooth and sensor value is above threshold value, call or msg function of mobile works to alert relatives of the user.

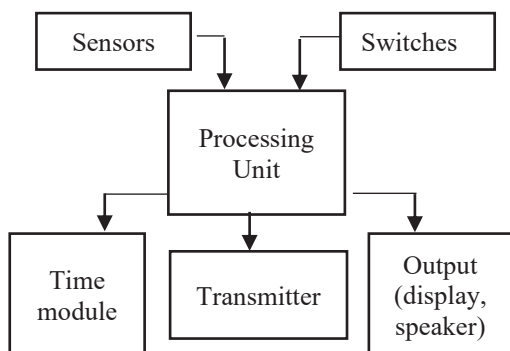


Fig.1.Block diagram of watch part

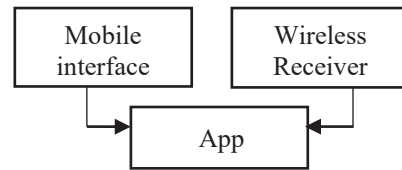


Fig.2.Block diagram of app part

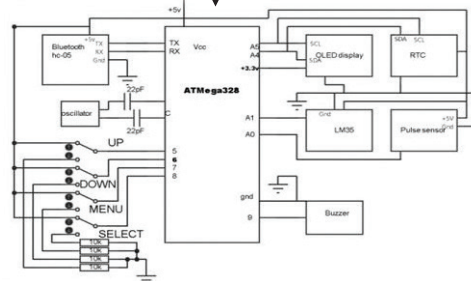


Fig.3.Circuit diagram of watch

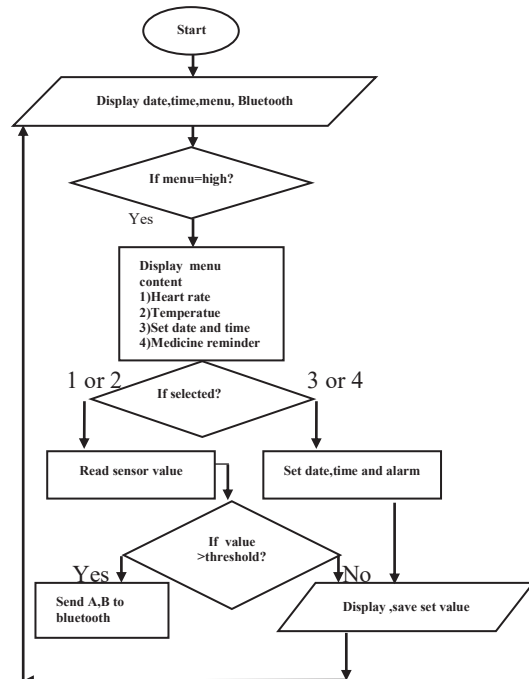


Fig.4.Flowchart of watch part

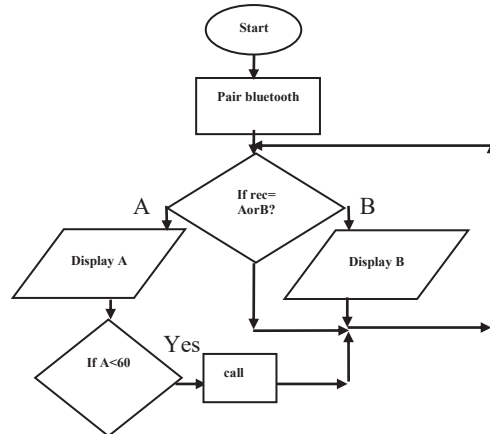


Fig.5.Flowchart of working of app part

COMPONENTS USED:

At Mega 328:Theheart of Arduino UNO having 8-bit and 28 Pins AVR Microcontroller operated at the range of (3.3 to 5)volt.It controls operation of the watch.

LM 35:It is the integrated circuit sensor which is used for measuring the body temperature. It draws only 60 micro amps from its supply and possesses a low self-heating capability.

RTC (Real Time Clock):It is a time and date remembering systems which have battery setup and when the watch is off ,it keeps themodule running

Bluetooth hc-05:It is theSerial Port Protocol module which is designed for transparent wireless serial connection setup. It is fully qualified V2.0+EDR (Enhanced Data Rate) 3Mbps.Modulation with complete 2.4GHz transceiver andBaseband[8]. Its range is about 9 meter.

OLED (Organic Light Emitting Diodes)display:It is a flat light emitting technology, made by placing a series of organic thin films between two conductors[1].It emit bright light when electric power is applied so back light is required.it have very readable display due to high contrast.

Buzzer:It gives audio as output for alarming purposes .

RESULT AND CONCLUSION:

All the connection was done properly in respective pins. Battery was connected in such a way that it can be recharged when required. LM35 was placed below the band to measure body temperature by setting up value analogous to temperature of below shoulder..Normally date, time, day were seen when power supplied.Heart beat and body temperature were successfully measured and medicine reminder also worked according to the set value.Another feature of his project including android app was successfully paired with the watch with adjustable contacts.The app worked well and was able to send message to contacts when the value exceeded threshold value.In app, first screen deals with receiving of sensor value and with second screen contacts were saved ,during the time of signal>threshold,sms is sent to that contact.

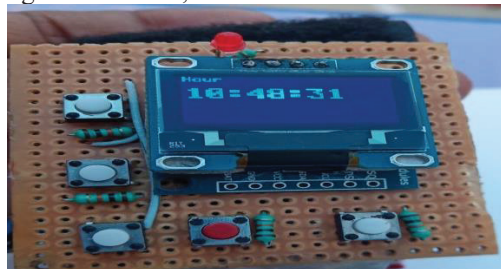


Fig.6.Actual watch components



Fig.7.Main display of watch .



Fig.8.Main menu display

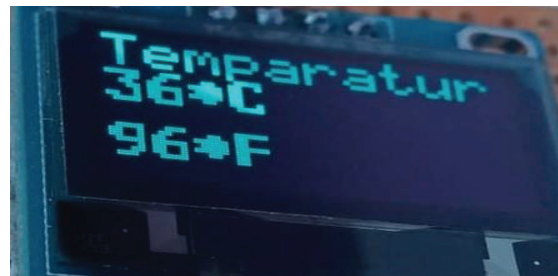


Fig.9. Temperature output

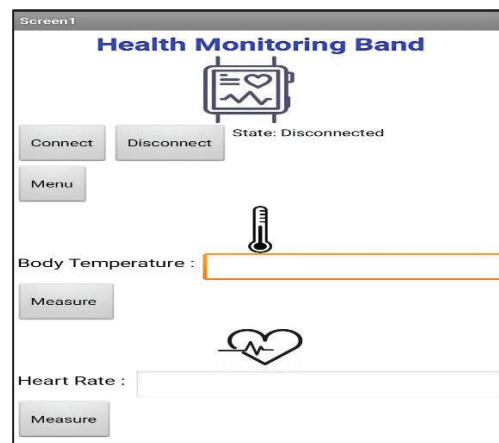


Fig.10..First screen of android app



Fig.11.Second screen of app

In app part, emergency contacts were selected and when Bluetooth was paired with watch, signal above threshold were received by the app which in turn send emergency sms to contacts.

Function	Before	After
Pulse	Pulsenot detected	User's pulse:72ppm
Temperature	Room temperature(86F)	User'sbody temperature(96F)

Fig.12 .Output display on the OLED

S/N	Field	Other papers	This paper
1.	Processor type	-Raspberry pi [9] -Arduino mini [10]	Atmega328 (chip only)
2.	Display type	-16*2 lcd[11] -Nokia lcd[10]	-oled display

Fig.13. Comparison table between this paper and other similar papers.

CONCLUSION:

Our research is focuses on the health monitoring band as stated by the heading.Increasing of health consciousness of people was the main motive for this creation. This gadget helps to keep track of our heart beat and temperature which are the primary features to indicate our health condition. Likewise, the watch can be connected to the mobile phones and has the facility of remainder and it displays time.

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