

BIOMETRIC BRACELET

Student of the group 1D51

Ukhov S. A.

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Introduction

- Nowadays, patients often require frequent monitoring of patients' health status. This leads to such shortcomings as long measurement time, low monitor accuracy and waste of labor. Also, manual inspection has its limitations and inconveniences, for example, for patients with infectious diseases and for patients for whom personal contact inspection is not convenient.



Why is it useful?



- To avoid such drawbacks, wireless remote patient monitoring systems are used. Such systems allow monitoring the parameters of the patient's condition outside the medical facility. The use of such systems also allows improving the effectiveness of monitoring, making it more convenient and saving time, both patient and doctor.

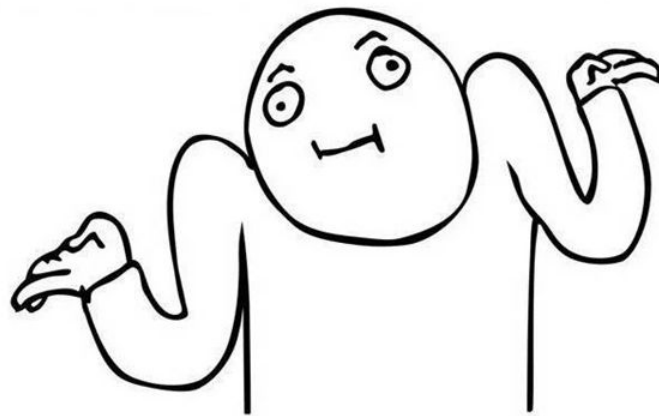
Aim

- To develop a system that monitors the state of human health.



Problems

- To analyze existing systems.
- To select the parameters that needs to be monitored by such system.
- To draw up a scheme, according to which it is possible to implement this system in the future.



Chapter 1. What is a biometric bracelet?

1.1. Designation

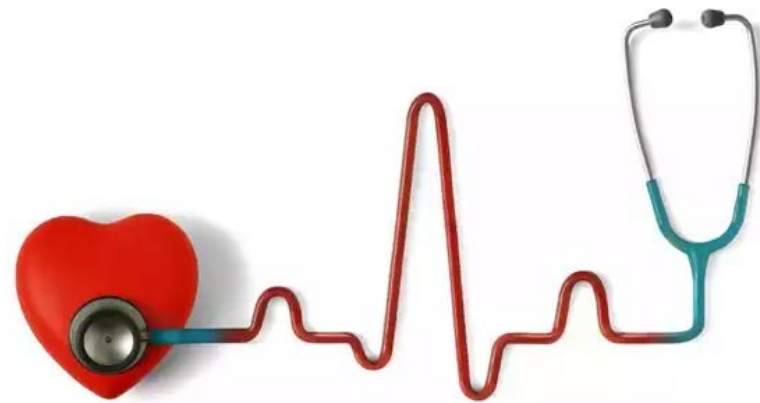
- By biometric bracelet (BB) — autonomous compact device placed on the patient's body and providing accumulation, and access to the accumulated data from biometric sensors.
- BB responds to a sharp deterioration of the state of the person (stress) and notifies the patient and the doctor about this change, the device readings are displayed on the panel for easy visualization.
- Also, this device is able to accumulate information about the state of the host.



Chapter 1. What is a biometric bracelet?

1.2. Basic characteristics

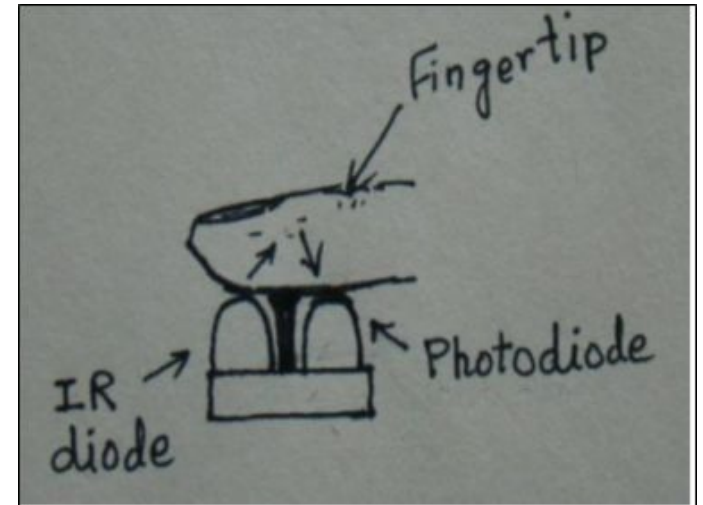
- Modern electronic technologies read a whole complex of human biometric characteristics, accumulating the received information and participating in its exchange through wireless communication.
- Our basic characteristics in the first stage of the study, a set of two physiological characteristics was selected:
 - temperature;
 - heart rate.



Chapter 2. System of the biometric bracelet

2.1. Sensor of fingers

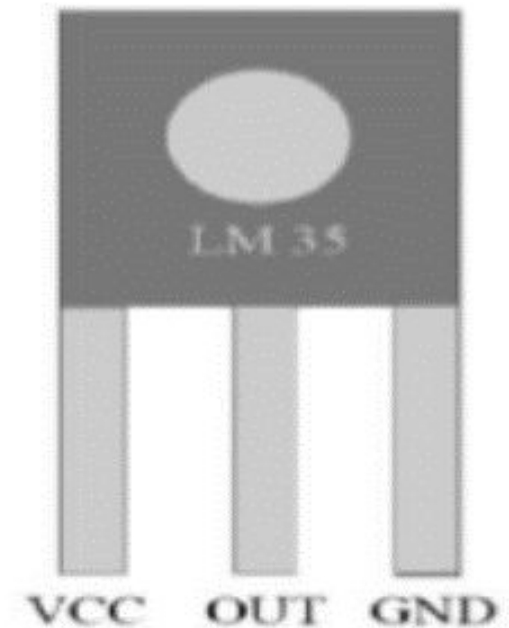
- The finger sensor consists of a photodiode and a bright LED.
- The LED and photodiode are mounted on a steel pipe.
- The photodiode and LEDs are mounted next to each other, as shown in figure.
- The light from the LED glows on the finger tissue that is inserted into the tube, and the change in blood volume changes the amount of light that falls on the photodiode. Thus, the photodiode and LED are installed on opposite sides to detect a change in transmitted light.



Chapter 2. System of the biometric bracelet

2.2. Temperature sensor

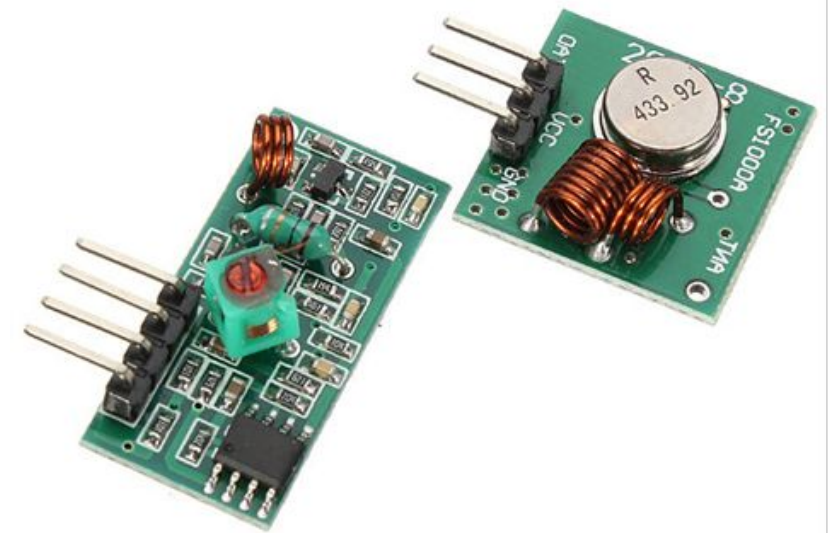
- It is a precision integrated temperature sensor.
- To measure the body temperature, the left pin of the LM35 is connected to the power supply (5 V), and the right pin is connected to the ground. The average output will give us an analog voltage, which is directly proportional (linearly) to the temperature.



Chapter 2. System of the biometric bracelet

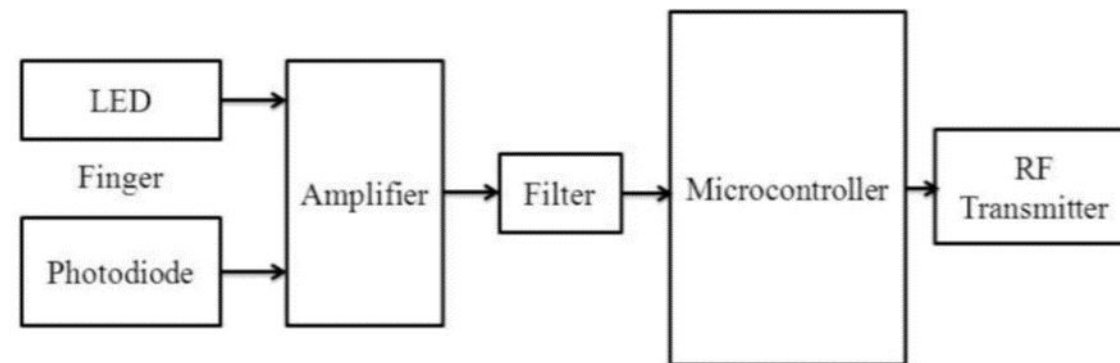
2.3. RF-module

- The RF module consists of a radio transmitter and a radio frequency receiver.
- The digital data are represented as variations in the amplitude of the carrier wave (Amplitude Shift Keying).
- The data is received by the radio frequency receiver at the same frequency as the transmitter used. The RF transmitter then transmits data through the radio frequency to the receiving end where the RF receiver receives the data and sends it to the microcontroller, which ultimately helps display data on the LCD at the remote end.



Chapter 3. Principle of operation

- The heartbeat was measured with the help of photodiode and bright LED while the temperature was measured by using precision integrated temperature sensor LM35.
- Both the data were processed in the microcontroller and sent to the remote end wirelessly by using RF transmitter and received at the remote end by using RF receiver.
- The received data was processed in the microcontroller and the data measured was displayed successfully with the help of LCD at the remote end.



Conclusion

- In the course of our work, the necessary theoretical material for creating a biometric bracelet was studied, electrical components and their characteristics were studied, and the desired operating principle of the device was compiled.



**THANK YOU FOR
ATTENTION**
