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ABSTRACT

In this project, we presented the design a device for measuring heart rate using fingertip to improve estimating the heart rate.When the heart beats a pressure wave moves out along the arteries at a few metres per second. This pressure wave can be felt at the wrist, but it also causes an increase in the blood volume in the tissues, which can be detected by a plethysmograph.As heart related diseases are increasing day by day, the need for an accurate and affordable heart rate measuring device or heart monitor is essential to ensure quality of health. There are many heart rate measuring devices in the market place. However, most heart rate measuring devices and environments are expensive and do not follow ergonomics,

but we described photoelectric plethysmograph which is robust and easy to make and which allows the rating of the heart to be displayed on an LCD without the need to make direct electrical connections to the body in this project. Our proposed Heart Rate Measuring device is economical and user friendly and uses optical technology to detect the flow of blood through index finger and that it is microcontroller based and hence the power consumption is very low and the device can be operated portable. Qualitative and quantitative performance evaluation of the device on real signals shows accuracy in heart rate estimation.

CONCLUSION

In this project, the design and development of a low cost microcontroller based heart rate measurement device has been presented. The device is based on an infrared emitter and infrared sensor. The sensors are clipped to the finger of person and as the heart baets the volume of the blood in the finger changes and the sensor detects this small chance. This change is then amplifed and fed to a microcontroller based system. The microcontroller calculates the heart rate and displays the results on an LCD every second.

The heart rate measurement device is efficient and easy to use. Both analog and digital signal processing techniques are combined to keep the device simple and to efficiently suppress the disturbance in signals.

Results showed that the heart rate can be filtered and digitized so that it can be counted to calculate an accurate pulse rate. The device is able to detect, filter, digitize and display the heart rate of a user ergonomically. The device has the advantage that it can be used by non-professional people at home to measure the heart rate easily and safely.