ABSTRACT

Heart is a human vital organ, it has function to pump/transport the blood to whole body. Blood pumping by the heart causes blood volume fluctuation in an organ. Photoplethysmograph (PPG) is an instrument capables to monitor fluctuation of blood volume. The data acquired from PPG can be used for examining human health.

The goal of this Final Project is building a prototype of wireless Photoplethysmograph system, a device for monitoring blood fluctuation and displaying the fluctuation graph. This system can be used for examining heart condition.

The PPG system consists of a sensor, amplifier, LPF, ADC, transmitter, receiver, USB interface device and a personal computer. Sensor consists of red LED and photoresistor (LDR) placed on finger. LED emitts light to the skin and the reflection of light is received by LDR. The light received by LDR is fluctuated because of blood volume fluctuation and results analog signal. Amplifier amplifies the analog signal and then it is filtered by LPF. ADC and microcontroller convert analog signal to serial digital signal. Then ASK module transmitts the signal through radio wave. In receiver this signal demodulated and then interfaced to computer through USB port (using virtual COM). Computer process and dispays data in graphic and numeric.

Usage of this PPG system such as for monitoring heart condition, counting heart beat per minute, examining respiration process. Measurement procedure is more flexible by using wireless system (eg : used by athlete in practical session).