

## **ABSTRACT**

Photoplethysmograph (PPG) is a device used to measure the condition of blood circulation is pumped by the heart in particular organs in the body. The results of these measurements can be used to determine the heart condition during a certain period. In addition to observing the performance of the heart, PPG can also be used to monitor and regulate breathing oxygen saturation in the blood.

In previous research by Imron Hadi Siswanto in 2007 with the title realization of Photoplethysmograph Based Mobile Phone for heart rate counting has developed a device based PPG mobile phone using bluetooth technology. The use of Bluetooth as the transmission medium deemed less effective because the data transfer process is limited to a certain distance. The use of embedded Ethernet technology to be especially appropriate for effectiveness and efficiency of performance of medical experts. With an embedded Ethernet system medical experts can perform remote monitoring of the patient's heart rate anywhere, anytime just by accessing an embedded Ethernet servers.

This is supported by the development of embedded systems technology based TCP / IP. The popularity of TCP / IP is able to make the process of communication and exchange of information becomes a very easy thing to do. Embedded systems integration between the network TCP / IP will bring several benefits, such as practicality and high connectivity. This integration Embedded known as Ethernet.

In this final assignment, PPG signals were acquired by using three Op-Amp as an amplifier with a total amplifier is 23.5809 times and filtering using a two LPF with the cut-off frequency of 20.54 Hz. Then the microcontroller AVR 8535 used as ADC and modifiers parallel to serial data before being sent to the network by WIZ110SR module that serves as converter of serial protocol into TCP / IP protocol. Users can access the server PPG system and monitoring using a PC connected to network. On the PC created software that can display a graph of the PPG signal and the calculated bpm.

**Keyword:** Embedded Ethernet, Photoplethysmograph, AVR 8535, TCP/IP, Filter