Abstract

Continuous measurement of oxygen level and pulse rate is very important for aged people, pregnant women and in many other critical situations. This is commonly monitored by a pulse
oxymeter. This paper presents a low-cost and a miniaturized pulse oxymeter to continuously measure patient’s blood-oxygen saturation level ($\text{SpO}_2$) and pulse rate. Change in intensity of light transmitted through tissue due to arterial blood pulse can be measured as a voltage signal called the photoplethysmographm (PPG). Oxygenated blood has different light absorption characteristics than deoxygenated blood under red and infra red wavelengths. So the hardware implementation is included placing of two LEDs (red and infra red) on the patient’s finger and a photo detector on opposite side of the LEDs to get the corresponding PPG signals which are used to estimate the $\text{SpO}_2$ by comparing the absorption characteristics of the two different colored light (red and infra red). As the PPG signal is mostly corrupted by patient’s hand movement, it is given to LabView window by DAQ card for further signal processing. In this paper a low pass filter is used for removing motion artifacts and a moving average algorithm is applied to remove high frequency noise content. The $\text{SpO}_2$ is calculated by computing the AC and DC components of both the red and infra red LEDs corresponding PPG signals. The pulse rate is determined by time domain peak detection algorithm in LabView signal processing module.

References


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