

Experiment-1 Lab-2

Date: - 20th January 2020

Task: -

In this lab we will be using a PPG sensor and interface it with Arduino to directly record a live PPG signals and filter it with appropriate filters.

We have interfaced the PPG sensor at the **A0** analog pin of the Arduino board and used a sampling frequency of 100 Hz i.e. the sampling time is 0.01 seconds.

What is the PPG Sensor?

A PPG or photoplethysmogram is an optically obtained plot which detects changes in the blood volume near the surface of the skin. It works by illuminating the skin using a LED and measuring the change in light intensity received after passing through the skin. The change in light intensity is measured by a photodiode. Thus, when blood volume increases at each pulse it can accurately detect the pulses.

Here, we have performed the same set of operations on a live *PPG data* as we did in Lab-1 namely: -

- Moving Average Filter: $y[n] = \frac{1}{L} \sum_{k=0}^L x[n - k]$
- Derivative Filter, first-order difference: $y[n] = x[n] - x[n - 1]$
- Derivative Filter, three-point central difference: $y[n] = x[n] - x[n - 2]$