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Design of a Photoplethysmograph in infrared based on an optical sensor

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Photoplethysmography (PPG) is an optical measurement for observing changes in blood volume in a tissue non-invasively.

Photoplethysmography in the infrared is based on two principles: the presence of a pulsatile signal generated by the arterial blood and the differential absorption of oxyhemoglobin.

As part of this work, we present a formatting circuit of PPG signal in the infrared. This study is divided into two main parts: an analog part presents the designing of formatting circuit (including a probe formed of an infrared LED and phototransistor, matching circuits, filters, amplifiers…), and in other hand, a digital part designed around an Arduino Uno board built upon the ATmega328 microcontroller exploited for data acquisition.
A Software programming of this board and the development of a data acquisition script allows to record signals in a data file, which are treated in a Matlab environment

Topics

Session D. Biomedical optics and sensors technology

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