World Academy of Science, Engineering and Technology
International Journal of Biotechnology and Bioengineering
Vol:12, No:02, 2018

Development of Soft-Core System for Heart Rate and Oxygen Saturation

Authors : Caje F. Pinto, Jivan S. Parab, Gourish M. Naik

Abstract : This paper is about the development of non-invasive heart rate and oxygen saturation in human blood using Altera NIOS II soft-core processor system. In today's world, monitoring oxygen saturation and heart rate is very important in hospitals to keep track of low oxygen levels in blood. We have designed an Embedded System On Peripheral Chip (SOPC) reconfigurable system by interfacing two LED’s of different wavelengths (660 nm/940 nm) with a single photo-detector to measure the absorptions of hemoglobin species at different wavelengths. The implementation of the interface with Finger Probe and Liquid Crystal Display (LCD) was carried out using NIOS II soft-core system running on Altera NANO DE0 board having target as Cyclone IVE. This designed system is used to monitor oxygen saturation in blood and heart rate for different test subjects. The designed NIOS II processor based non-invasive heart rate and oxygen saturation was verified with another Operon Pulse oximeter for 50 measurements on 10 different subjects. It was found that the readings taken were very close to the Operon Pulse oximeter.

Keywords : heart rate, NIOS II, oxygen saturation, photoplethysmography, soft-core, SOPC
Conference Title : ICBCBBE 2018 : International Conference on Bioinformatics, Computational Biology and Biomedical Engineering
Conference Location : Mumbai, India
Conference Dates : February 22-23, 2018