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| **Title:** | Design, Simulation and Implementation of a Digital Pulse Oxygen Saturation Measurement Meter using Arduino Microcontroller | | |
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| **Abstract:** |  |
| If a person can monitor his/her oxygen saturation level intermittently then he/she can identify his/her condition early and thus he/she can seek a doctor’s help. This paper reports the design, simulation, and implementation of a low-cost pulse oxygen saturation measurement device based on a reflective photoplethysmography (PPG) system using an integrated circuit sensor as the fundamental component of this health status checking device. The measurement of the physiological parameter is the blood oxygen saturation level (SpO2 ) in the peripheral capillary. This work has been implementedusing an Arduino Uno R3 microcontroller along with this sensor integrated circuit (IC). The system is designed in the Proteus environment and then simulated to check its performance. After that, the hardware implementation is performed. We used a clipping type optical sensor to sense the arterial oxygen saturation level of blood  signal from the fingertips of an individual and then transformed it into the digital data in the microcontroller through its programming its instruction. The designed system was tested by measuring the SpO2 level for several people of different ages, from 12 to 57 years of age. Besides, the same people were tested using a standard machine purchased from the market. Test results were found very satisfactory as the average percentage of error was very low, 1.59% only. | |