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| **Title:** | Design and Simulation of Heartbeat Measurement System using Arduino Microcontroller in Proteus | | |
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| **Abstract:** |  |
|   Abstract— If a person can monitor his/her heart rate regularly then he/she can detect heart disease early and thus he/she can enjoy longer life span. Therefore, this disease should be taken seriously. Hence, many health care devices and monitoring systems are being designed to keep track of the heart disease. This work reports a design and simulation processes of an Arduino microcontroller based heart rate measurement and monitoring system in Proteus environment. Clipping sensors were utilized to sense the heart rate of an individual from the finger tips. It is a digital device and uses mainly infrared (IR) transmitter (mainly IR LED) and receiver (mainly IR photo-transistor or IR photo-detector). When the heart pumps the blood and circulates it among the blood vessels of the body, the changed blood pressure is detected by the transmitter and then reflected back to the receiver accordingly. The reflected signals are then processed inside the microcontroller through a software written assembly language and appropriate heart rate (HR) is determined by it in beats per minute (bpm) from the detected signal for a duration of 10 seconds and display the same in bpm on the LCD screen in digital format. The designed system was simulated on several persons with varying ages, for example, infants, adult persons and active athletes. Simulation results were found very satisfactory. | |