

**A LOW COST DIGITAL HEART AND RESPIRATORY RATE
MONITORING SYSTEM**

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ABSTRACT

This project aims to design a low cost and portable heart and respiratory rate monitoring system. The proposed monitoring system was combining both the heart and respiratory rate in one system. The heart rate monitoring system was using an infrared LED and photodiode for the pulse sensor while the respiratory rate monitoring system was using a thermistor as a sensor. The system has been tested for a group of students with an age between 20 to 25 years old for the functionality test. The data were recorded and has been compared with the standard heart and respiratory rate measurement for the same group age. Both heart and respiratory rate shows a normal measurement where the heart rate result was between 60 to 100 beats per minute (BPM) and the the respiratory rate result was between 12 to 18 breaths per minute (BPM). It shows that this proposed system are able to produce a reliable measurement data for both heart and respiratory rate monitoring system.

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CHAPTER 1

INTRODUCTION

BACKGROUND OF STUDY

Heart and respiratory rates in human body system are important and frequent become a first signal for critical health problem to occur. Both of them are scientifically related with each other. To produce energy, the human body uses oxygen that was supplied through the bloodstream. This automatically will affect the human's heart and respiratory rate when they were doing physical activities because the flow of the blood in the bloodstream will change depends on the activities of the human's body. The heart and respiratory rate was measured in beats per minute (BPM) and breath per minute (BPM) respectively. Usually, the average normal resting heart rate is 60 to 100 beats per minute while the average normal resting respiratory rate is 12 to 18 breaths per minute[8]. However, it is also depends on the age and the physical fitness of a person. Different age and physical fitness will affect their normal heart rate and respiratory rate.

One of the common medical devices that were used to measure the human's heart rate is electrocardiogram (ECG). An ECG has more various functions other than measure the heart rate such as determine the position and size of the heart chamber and check any heart's damages. It has several electrodes that can be attached to the several human's body part such as the chest, the wrists, the shoulder and the ankle[1].