FINAL YEAR PROJECT REPORT
(EEE368)

4x10m CONDITIONING TEST SYSTEM FOR ATHLETE

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ABSTRACT

In this work, the development of a 4x10m conditioning test system is proposed. This system could help the coaches to monitor their athletes more efficiently. The main data obtained from this system are the time taken by athlete to complete the 4x10m conditioning test precisely and also value of the oxygen level in blood (SpO2), heartbeat rate (bpm) of the athlete before and after the conditioning test. The main modules used in the proposed system are the Arduino UNO for the microcontroller and followed by an infrared sensor to detecting athlete's movement and pulse oximeter sensor (MAX3010) to measure the heartbeat rate and SpO2. Additionally, a temperature and humidity sensor (DHT22) module was used to provide the test examiner with environmental data, including temperature and humidity levels. The Arduino UNO is the main controller for this 4x10m conditioning test system in which it is assigned to send and receive any data from the sensors and submit the information to the 20x4 LCD display, so the data is analyzed and displayed to the test observer. The main result of this project is to measure the overall time for athlete to finish the 4x10m conditioning test as well as the split time for each lap.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Conditioning test is a very common test that are conducted by the coaches for their athletes. A conditioning test is a physical assessment designed to evaluate an athlete's fitness, particularly in terms of their cardiovascular endurance, speed, agility, and sometimes strength. These tests are commonly employed in various sports and fitness programs to gauge an individual's athletic capabilities and overall physical preparedness. The objective is to measure how well an individual's body responds to a specific set of physical demands, often simulating the requirements of their sport or fitness goals.

The conditioning test that are been focused for this project is the 4x10 meter conditioning test. The 4x10 meter conditioning test specifically involves a series of four laps of 10-meter sprints. Each of the laps are being taken the time measurement of the athletes sprinting. This time measurement shown the capability of the athletes on sprinting. Usually, the coaches who manually record the athlete's time using a split stopwatch. However, if the coach is handling many athletes at once, it will quite be challenging for him to push the split stopwatch for four laps for each of the athletes they are manages. Other than that, when pushing the split stopwatch manually to get the time measurement most likely there will be a human error such as starting or ending the stopwatch.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The 4x10 meter conditioning test system for athlete is an initiative solution that integrates advanced technology to provide real-time data on environmental conditions, athletes' health parameters, and performance metrics, enhancing the accuracy and efficiency of the assessment process of the 4x10 meter run. The system using Arduino Uno as its main microcontroller that control all the element in this project.

The system uses an 20x4 LCD display as the main output that display all of the data that are gathered during the conditioning test such as temperature and humidity, Heart Rate(bpm), and time measurement. A momentary push button is utilised as a switch to read the next piece of data on the 20x4 LCD display.

There are three type of sensor that are used in this system which is temperature and humidity sensor (DHT22) that are used to read the temperature and humidity of environment, Pulse Oximeter Sensor (MAX3010) that are used to read heart rate of athlete, and Infrared Sensor (IR sensor) that are used to take the time measurement of the 4x10 meter run.