Introduction
Nowadays, many people in modern cities are suffering from health problems mainly caused by being overweight. All these medical concerns and self-image problems have aroused the public’s attention regarding their body weight. In particular, young ladies and the elderly are concerned more about their body fat range. One relatively safe, easier to use, inexpensive and non-invasive type of body fat meter is needed for keeping the fitness of the human body. Thus the information of a person’s weight, height, age, and sex, can be used to calculate an approximate value for that person’s body fat percentage by which it can help experts to diagnose the client’s problem more accurately and effectively.

Aims and Objectives
Our project is to build a device with 2 measuring methods, Biostatistical Impedance Analysis (BIA) and Near Infrared Interactions (NIR). BIA measures body composition by sending a low, safe electrical current through the body. The current passes freely through the fluids contained in muscle tissues, but encounters difficulty/resistance when it passes through fatty tissue. This resistance of the fat tissue in the current is termed “biostatistical impedance”, and is accurately measured by body fat scales. When set against a person’s height, gender and weight, the scales can then compute their body fat percentage.

NIR works by sending the NIR light to the tissues and is reflected off the bone back to the detector. The NIR data is entered into a production equation with the person’s height, weight, frame size, and level of activity to estimate the person’s body fat.

Methodology
BIA:

NIR:

Implementation
BIA:

NIR:

Overview

Introduction

Aims and Objectives

Methodology

Implementation

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BIA:

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NIR:

The NIR circuit board

The AD5995 evaluation kit manufactured by Analogy Device

Connect with the voltage output of the sensor

Connect with the voltage output of the sensor

Software:

NIR
The AD5995 board works as the ADC part. After it reads the ADC data, the result will be transported to the AD2024 board. Then the AD2024 board will do the calculation and display the output on screen. The readings are around 0-10% due to using LED with wave length of 850nm which has high reflection on water.

The AD2024 board:

Weight (kg)
Height (cm)
Fat (%)

Weight (kg)
Height (cm)
Fat (%)

Weight (kg)
Height (cm)
Fat (%)

Weight (kg)
Height (cm)
Fat (%)

Weight (kg)
Height (cm)
Fat (%)

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