The Potential of a Classification-based Algorithm to Calculate Calories in Real-Time Via Pattern Recognition

Marhaini M.S[1], Mohamed Ariff Ameedeen[12]

[1] Faculty of Computer System and Software Engineering
Universiti Malaysia Pahang, Malaysia
[2] IBM Centre of Excellence, Universiti Malaysia Pahang, Malaysia
pcc14005@stdmail.ump.edu.my, mohamedariff@ump.edu.my

Abstract. Calories refer to a unit of energy that people should consume based on total energy needed. Thus, a system for health monitoring applications that can measure calories and nutrition can be very useful. This research is mainly focused on creating a new algorithm based on classification technique to calculate food calorie intake in real-time. Enhancement on Extreme Learning Machine (ELM) algorithm will be done to get better results in terms of accuracy and speed of calculating the food calorie. The ELM algorithm will be applied to an ultra-mobile Near Infrared (NIR) spectrometer. While the algorithm helped to classify different types of wavelengths produced from the sensor, a classification-based algorithm via Pattern Recognition Method will be used to classify and match the food components. The results will displayed the total amount of calories consumed per day, per week and per month with total amount of calories left in a mobile application.

Index Terms—Extreme Learning Machine (ELM), Pattern Recognition, ultra-mobile Near Infrared (NIR) spectrometer, Food Calorie, Classification

1 Introduction

A calorie is a unit of energy. It supplies energy to the human body. It has strong relationships with human health conditions. Nowadays, many people do not only lack health awareness, but there are a few whom are unable to practice vital health tips due to their busy schedules. People are, generally, getting more and more unconcerned about what kinds of food they eat every day. They keep on eating variety of food either heavy meal or some kinds of snack meal without checking the nutrition labels on the food packaging. They are also not practicing a healthy lifestyle which is important to maintain and improve human health and body fitness. Thus, this kind of unhealthy lifestyle and unhealthy food intake are the root causes of many kinds of diseases such as obesity

The increase in obesity worldwide has significant impact on health impairment and reduced quality of life [1]. In fact, obesity has an important contribution to the global incidence of cardiovascular disease, diabetes mellitus, osteoarthritis, cancer, work disability and sleep apnea [2]. Although obesity is a multifactorial disease, an expenditure and imbalance between energy intake is commonly cited as its only cause