

IoT-based Pocket Nutrition Monitor and Recommender System

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Abstract— Early nutrition intervention in infants and adolescents is necessary to prevent or counteract the health effects of overweight and bad eating habits. Monitoring an individual's dietary behavior, including food preference consumption patterns, are the main steps in tackling the causes of obesity. As smart phones and IOT is used almost in every field, this work as well would try to provide a solution using it as a base. The system comprises of an intelligent sensor board made using IOT technology and it will be used along with a smart phone application as a whole, to be considered as a product. The proposed system can be broadly categorized into four significant methods. 1) A method for quantifying means getting the weight of nutritional elements, a proposed machine learning methodology for food classification, 3) A few methods for acquiring data, in which the details of different ways for obtaining nutritional facts of the given product to be consumed will be acquired, and 4) A technique for prediction of meals to be ingested by a person in future, i.e. after few hours will be decided on basis of current time of meal and quantity of leftover food. The implemented design is highly accurate in diet monitoring as well as an cost efficient system. Along with the analysis of nutritional contents of the meal, the system even provides suggestions in order to achieve a completely balanced diet.

Keywords—Smart Healthcare, Nutrition monitoring, Internet of things, Bayesian Classification, Meal prediction & Suggestion.

I. INTRODUCTION

Improper and nutrition-less foods consumed at early age of life, could various modalities in later life or in old age. This may involve cognitive disorders, poor immunity, weakened structure of skeletal, hairlines thinning, gum-bleeding, cancers and many more diseases also. This project is developed for handling the daily nutrition record of an individual, through the meal which is taken by him and assist the person to keep going with healthy nutrition goals. In accordance with the Body Mass Index (BMI) of an individual, a person should keep a track of nutritional gain from every food item consumed, in order to gain, lose or maintain the desired weight. Therefore, an application developed efficiently handles and keeps track of all nutritional records. It provides a log, which is accessible for user, to check and update information of daily meals. Following these records, will help the user or the doctor to plan his future diet [1].

In this paper, a study for various solutions to enhance the quality of nutrition for infants is done. As smart phones and IOT is used almost in every field, this work as well tries to provide a solution using it as a base.

II. PROBLEM STATEMENT

Early nutrition intervention in infants and adolescents is necessary to prevent or counteract the health effects of overweight and bad eating habits. High nutritional quality is an important period of childhood and adolescence for diet because physical needs of nutrients are higher than energy requirements. In addition, many core eating habits and behavioral patterns have been developed that can last a whole lifetime [2].

Monitoring an individual's dietary behavior, including food preference consumption patterns, are the main steps in tackling the causes of obesity. An automated system that monitors the diet would be of great convenience. The system is also expected to state, whether a balanced diet goal is achieved or not. If not, it should also provide some suggestions to achieve the same, along with future meal predictions.

III. RELATED WORK AND PRIOR RESEARCH

The initial few years of life, is the period in which major brain development takes place along with overall growth of the personality. During this interval, nourishment and environmental elements play a crucial role impacting the growth as well as cognitive development of infants [3]. Importance of nutrition and its relation with health is proper also being studied from [4,5]. Various solutions have been given to enhance nutrition quality in human life. Using the approach of big data, an energy management System was designed, which is based on IoI in paper [6]. Necklace band along with smart sensors have been constructed, to measure and study proper swallowing of individuals [7]. There are even intelligent wearable sensor devices created to monitor food consumption [8]. OCR (Optical Character Recognition) is a technique used to identify the food ingredient through cameras. CNN (Convolution Neural Network) is used to detect food items [1]. For determination of balanced nutrition after every meal consumption, the 5-layer model of deep learning was proposed. With thickly linked hidden layers, based on


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