Nutrition Assistant Application

Literature Survey

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1. ## Development Of A Cloud Based Solution For Effective Nutrition Intervention In The Management Of Lifestyle Diseases

   Author and Year : Manju P George, C.A.Kalpana. November 2020

   Source: Asian Journal of Multidimensional Research (AJMR)

   Findings:

   - The cloud based system would have the ability to calculate the nutritional requirements and to guide first line nutritional management to patients and clients automatically.

- Also, it serves as an electronic medical and dietetic record, and a personalized nutrition consultation approach can enable clients to converse to his/ her personal dietitian at their own convenient setting.

- Authenticity of the consultant dietitian would also be ensured by the responsible team providing nutrition support.

2. Enhancing cloud and Big data systems for healthy food and information systems practice: A conceptual study

Author and Year : Sreeramana Aithal, P.K. Paul, A.Bhuimal

November 2017

Source: International Journal of Scientific Research in

Biological Sciences

Findings:

- Cloud computing may be applicable in the field of Food and Nutrition.

- Moreover, the paper also talks about cloud computing applications in different and diverse areas of Food Science, Nutrition and Dietetics. Further, the paper discusses some of the contemporary and future challenges to build Cloud Computing based Food Information Systems.

3. Smart Log system that performs automated nutrition monitoring and meal prediction

Author and Year: Prabha Sundaravadivel,Kavya Kesavan,Saraju P.Mohanty,Lokeshwar Kesavan

Source: Research Gate

Findings:

- Malnutrition is a condition where the body is deprived of important nutrients required to maintain healthy tissues and organ function.

- In the modern world, where most of the infants are being sent to daycare, an automated food monitoring system helps in keeping track of their food intake. In this paper an automated food monitoring system with predictions to help a balanced meal is proposed.

- This sensor system consists of a piezo-based sensor board which can help in analyzing the weight of each meal and a smartphone camera to obtain nutrition facts of the ingredients.

4. The Development and Implementation of a Software Tool and its Effect on the Quality of Provided Clinical Nutritional Therapy in Hospitalized Patients

Author and Year: Maria Skouroliakou, PhD, Christina Kakavelaki, RD, Konstantinos Diamantopoulos, MSc, Maria Stathopoulou, MSc, Ekaterini Vourvouhaki, PhD, Kyriakos Souliotis, PhD

Source: Journal of the American Medical Informatics Association

Findings:

- "DIET" has the ability to calculate the nutritional requirements and to produce daily menus of patients automatically.

- Also, it serves as an electronic medical and dietetic record and it can produce daily reports regarding portions, quantities and cost of meals. "DIET" implementation resulted in error decrease and thus in improvement of menu planning, accuracy and recovery of data and decreased the time spent on menu planning.

5. Food calorie estimation using machine learning and image processing

Author and Year: Shaikh Mohd. Wasif ,Swapnil Thakery, Amir Nagauri, Sheetal Ignatius Pereira

Source: International Journal of Advance Research, Ideas and Innovations in Technology

Findings:

- This paper focuses on creating software which gives the calorie of the food which the user is going to consume.

- In order to achieve this, the software will take two images as input from the user, the top view and the side view.

- The food item in the image will be detected with the help of Faster R-CNN algorithm.

- After segmentation of images, the volume of the food item is calculated using the known volume of the probe object.

- After the calculation of volume, the mass of the food item is calculated with the help of formulas and then the calories of the food item will be calculated using the relation between mass and calories.

6. Predicting calorific value for mixed food using image processing

Author: R. Kohila,R. Meenakumari

Source: Research Gate

Findings:

- The image of the food is transmitted through a mobile device and it initially undergoes segmentation with Fuzzy C-means Clustering Segmentation which fixes the cluster centre based on the group data unlike the K-means Clustering which can be erroneous if the cluster centre is not defined properly by the user. The mathematical morphology is utilized as a tool for extracting the

- Image components and the region shape description such as erosion, dilation, opening and closing. Feature extraction is performed to retrieve interesting parts of the image and then calorie measurement is done.

7. Investigation of Nutritional Status of Children based on Machine Learning Techniques using Indian Demographic and Health Survey Data

Author and Year: Sangita Khare , S Kavyashree , Deepa Gupta, Amalendu Jyotishi

Source: ScienceDirect

Findings:

- Malnutrition is the leading causes of infant mortality among developing countries including India.

- This study designs a prediction model for malnutrition based on machine learning approach, using the available features in the Indian Demographic and Health Survey (IDHS) dataset and comparing that with the literature identified features.

- Our findings suggest that machine learning approach identifies some important features not identified in extant literature. Subsequently, logistic regression was carried out to identify the probabilities of these features in explaining malnutrition.

- The paper contributes in exploring the possibilities of using artificial intelligence in identifying probable correlates of malnutrition.

8. Food Item Recognition and Intake Measurement Techniques

Author: Adnan Shehzad, Nauman Zafar,Mir Hassan, Zhidong Shen

Source: Research Gate

Findings:

- The photograph then passes some pre-processing steps, and after successful segmentation, many physical features are examined such as shape and size etc.

- Also, dimensions of the food object are determined. The concluding step is then recognition along with calorie estimation. In this paper, different calorie estimation techniques are reviewed.

- The main aim of this review paper is to do a critical analysis of recent studies on accurate calorie estimation and food item recognition.

- We contribute to building a system that provides tools to monitor calorie intake by estimating calories based on food item recognition and accurate volume calculation.

9. Food calorie measurement using deep learning neural network

Author: **Parisa Pouladzadeh, Pallavi Kuhad, Sri Vijay Bharat Peddi, Abdulsalam Yassine**

Source: Research Gate

Findings:

- In this paper, we propose an assistive calorie measurement system to help patients and doctors succeed in their fight against diet-related health conditions.

- Our proposed system runs on smartphones, which allow the user to take a picture of the food and measure the amount of calorie intake

automatically.

- In order to identify the food accurately in the system, we use deep convolutional neural networks to classify 10000 high-resolution food images for system training.

- Our results show that the accuracy of our method for food recognition of single food portions is 99%. The analysis and implementation of the proposed system are also described in this paper.

10. DeepFood: Food Image Analysis and Dietary Assessment via Deep Model

Author: Landu Jiang, Bojia Qiu, Xue Liu, Chenxi Huang

Source: Research Gate

Findings:

- In this paper, we develop a deep model based food recognition and dietary assessment system to study and analyze food items from daily meal images .

- Specifically, we propose a three-step algorithm to recognize multi-item images by detecting candidate regions and using deep CNN for object classification. The system first generates multiple region of proposals on input images by applying the Region Proposal Network (RPN) derived from Faster R-CNN model.

- It then indentifies each region of proposals by mapping them into feature maps, and classifies them into different food categories, as well as locating them in the original images.

- Finally, the system will analyze the nutritional ingredients based on the recognition results and generate a dietary assessment report by calculating the amount of calories, fat, carbohydrate and protein.