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Calories and Nutrition Measurement from the Image of Food

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Abstract: *Obesity is the major cause of overweight this leads to the type II diabetes, heart disease, and cancer. Measuring the food is very important for a successful healthy diet. Measuring calorie and nutrition in daily food is one of the challenge methods. Smartphone plays a vital role in today's technological world using this technique will enhance the issue in intake of dietary consumption. In this project, a food image recognition system for measuring the calorie and nutrition values was developed. After taking the food image the colour, shape, size and texture features are extracted and it is given to the K-nearest neighbour (KNN) for recognizing the food and then the calorie value is measured with the help of nutrition table.*

Keywords: *Calorie Measurement, Food Image, K-Nearest Neighbour (KNN), Obesity, Healthy Diet, Nutrition.*

I. INTRODUCTION

This project known as Img2 calories app can count the calories of foods from the photos on peoples. Instagram feed the app that uses advanced image recognition technology tell you the biological process price of food. it'll able to establish any foods that individuals capture in photos and associate a calorie quantity to each item, mistreatment visual analysis, and pattern recognition methodology. Img2 calories we have a tendency to use subtle deep learning algorithms to calculate the correct information for calories and apply it to photos. Keep track of calorie intake is laborious and time intense process-so abundant so only a few of us stick with diligently. The simplest half is that it will work with Instagram- quality photos don't want a better answer. DSLR camera. Such associate degree app might go a protracted way in serving to individuals develop healthy feeding habits. Img2 calories would be profit calorie-counting consumers United Nations agency are involved concerning portion management. Doctors and medical researchers might conjointly combination data from the calorie app for analysis. In our project, we have a tendency to conjointly aim at mistreatment Smartphone as monitoring tools as they're wide accessible and easy to use. Our system is presently one that not solely explains and discusses uncertainties in image-based food calorie measuring; however, it conjointly measures and presents actual uncertainty results in mistreatment food pictures and its application situation. This puts our app properly within the context of Instrumentation and Measurement analysis and ends up in a lot of significant results for food recognition systems. Obesity in adults has become a heavy downside. Recent studies have shown that weight individuals are a lot of likely to own serious conditions like high blood pressure, heart attack, sort II polygenic disorder, high steroid alcohol, and breathing disorders. And also the main explanation for fat is the imbalance between the number of food intake and energy consumed by the people. So, so as to lose weight in a very healthy method, still on maintain a healthy weight for traditional individuals, the daily food intake should be measured. During this paper, we have a tendency to propose an app to live calorie and nutrient intake employing a Smartphone or the other mobile device equipped with a camera and records a photograph of the food before and after feeding it so as to live the consumption of food calorie and nutrient parts. The most explanation for fat is that the imbalance between the number of food intake and energy consumed by people. So, so as for the weight to slim down in a very healthy method, still as for traditional individuals to take care of a healthy weight, daily food intake should be measured [4]. Obesity treatment wants the patient to notice the number of the daily food intake, however, in most cases, it's not easy for the patients to live or management their daily intake because of the dearth of nutrition, education or self-control. Therefore, by employing a semiautomatic food intake watching system, we will assist the patient and supply a good tool for the fat treatment. Nowadays, new technologies like computers and good phones are concerned within the medical treatment of various styles of diseases, and fat is taken into account joined of the common diseases. Within the previous few years, numbers of food intake mensuration strategies are developed.

II.LITERATURE REVIEW

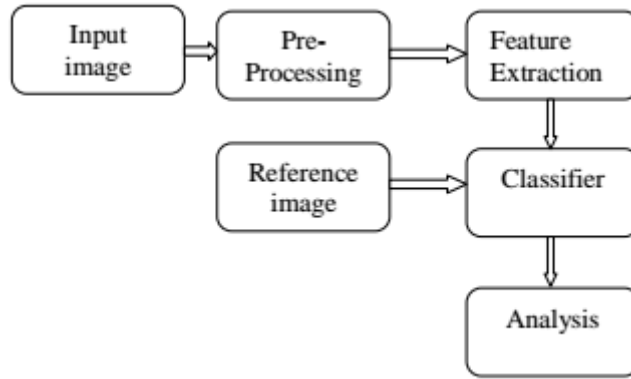
1. **World Health Organization, Geneva, Switzerland.(2011, Oct.).Obesity Study [Online] Description:** -As people across the globe are becoming more interested in watching their weight, eating healthier and avoiding obesity, a system that can measure calories and nutrition in every day meals can be very useful. In this paper, we propose a food calorie and nutrition measurement system that can help patients and dieticians to measure and manage daily food intake. Our system is built on food image processing and uses nutritional fact tables. Recently, there has been an increase in the usage of personal mobile technology such as Smartphone or tablets, which users carry with them practically all the time. Via a special calibration technique, our system uses the built-in camera of such mobile devices and records a photo of the food before and after eating it to measure the consumption of calorie and nutrient components. Our results show that the accuracy of our system is acceptable and it will greatly improve and facilitate current manual calorie measurement techniques.
2. **Handbook of Obesity, 2nd ed.BatonRouge, LA, USA: Pennington Biomedical Research Center, 2004.Author: - HUANG Shiqi, LIU Daizhi, Hu Mingxing Description:** As people across the globe are becoming more interested in watching their weight, eating more healthy, and avoiding obesity, a system that can measure calories and nutrition in everyday meals can be very useful. In this paper, we propose a food calorie and nutrition measurement system that can help patients and dieticians to measure and manage daily food intake. Our system is built on food image processing and uses nutritional fact tables. Recently, there has been an increase in the usage of personal mobile technology such as Smartphone or tablets, which users carry with them practically all the time. Via a special calibration technique, our system uses the built-in camera of such mobile devices and records a photo of the food before and after eating it to measure the consumption of calorie and nutrient components. Our results show that the accuracy of our system is acceptable and it will greatly improve and facilitate current manual calorie measurement techniques.
3. **A food portion size measurement system for image based dietary assessment,” in Proc. IEEE 35th Bioeng. Conf., Apr. 2009, pp. 3–5.Author: -J. Wenyan, Z. Ruizhen, Y. Ning, J. D. Fernstrom, M. H. Fernstrom, R. J.Sclabassi Description:** A novel system consisting of a camera and a light emitting diode (LED) is presented for measuring food portion size. The LED is positioned at a fixed distance besides the camera with its optical axis parallel to the optical axis of the camera. The distance to and oblique angle of the object plane are calculated according to the deformation of the projected spotlight pattern. Experimental results show that satisfactory measurements of food portion size can be obtained with this simple system.
4. **A novel method for measuring nutrition intake based on food image,” inIEEE Int. Instrum. Meas. Technol. Conf., Graz, Austria, May 2012, pp. 366–370. Author: -R. Almaghrabi, G. Villalobos, P. Pouladzadeh, and S. Shirmohammadi Description:** -In this paper, a food nutrition and energy intake recognition system for medical purposes is proposed. This system is built based on food image processing and shape recognition in addition to nutritional fact tables. Recently, countless studies suggested that the usage of technology such as Smartphone may enhance the treatments for obesity and overweight patients. Via a special technique, the system records a photo of the food before and after eating in order to estimate the consumption calorie of the selected food and its nutrients components. Our system presents a new instrument in food intake measuring systems which can be useful and effective in obesity management.
5. **“An identification approach for 2-Dautoregressive models in describing textures,” CVGIP, Graph. Models Image Process. vol. 53, no. 2, pp. 121–131, 1993 Author: -B. Kartikeyan and A. Sarkar,**

DESCRIPTION

A technique for identification of the autoregressive components is developed to describe textural regions of digital images by a general class of two-dimensional autoregressive model. Since for such modeling the feature spaces for different classes are different, a classifier and a recognition scheme using the parameters of such models are presented. Examples with synthetic textures are presented to illustrate that the model identification is appropriate. The classification scheme is illustrated with real periodic and periodic textures. The overall misclassification rate is about 2.4%.

IIISURVEY OF PROPOSED SYSTEM

The overall style is shown in Fig. 1. Because the figure shows, at the first stage, pictures area unit taken by the user with a mobile device followed by a pre- processing step. Then, at the segmentation step, every image are analyzed to extract various segments of the food portion. It's legendary that while not having a decent image segmentation mechanism, it's not possible to the method the image suitably, hence we tend to used colour and texture segmentation tools. We are going to show however these steps result in associate correct food separation theme. For every detected food portion, a feature extraction method must be performed. During this step, varied food options together with size, shape, colour, and texture are extracted. The extracted options are sent to the classification step wherever, mistreatment the support vector machine (SVM) theme, the food portion are known. Finally, by estimating the realm of the food portion and mistreatment some organic process tables, the calorie price of the food are extracted. The thumb of the user and its placement on the plate. May be a one-time standardization method for the thumb that is employed as a size relation to living the real- life size of food parts within the image. We tend to rumoured the concept of mistreatment the thumb for standardisation, moreover as its implementation. An associate example of food image capturing and thumb isolation and activity.



Block Diagram

IV.METHDOLOGY

1. K Means Clustering

Clustering may be thanks to separate cluster of objects. K suggests that treats every object as having a location in house. It finds partitions such objects at intervals every cluster square measure as near one another as doable and as removed from objects in other as doable .K suggests that agglomeration needs range of clusters to be partitioned off. During this case the numbers of clusters square measure 3 thus 3 image clusters square measure shaped.

2. Texture feature extraction

It is extremely appropriate for our purpose wherever the feel options square measure obtained by subjecting every image to a physicist filtering operation during a window around every picture element. we are able to then estimate the mean and also the variance of the energy of the filtered image.

3. Food Portion Volume Measurement

To calculate the surface area for a food portion, we propose to superimpose a grid of squares onto the image segment so that each square contains an equal number of pixels and, therefore, equal area. First, compared with other methods, the grid will more easily match with irregular shapes, which is important for food images because most of the food portions will be irregular. Naturally, there will be some estimation error, but this error can be reduced by making the grid finer. Second, depending on the processing capabilities of the user’s mobile device and the expected system response time from the user’s perspective, we can adjust the granularity of the grid to balance between the two factors.

Table 1 Calorie value from nutrition table

<i>Food Name</i>	<i>Measure</i>	<i>Weight (grams)</i>	<i>Energy</i>
Apple with skin	1	140	80
Potato, boil, no skin	1	135	116
Orange	1	110	62
tomatoes, raw	1	123	30
Bread white, commercial	1	100	17
Cake	1	100	250
Egg	1	150	17
Cucumber	1	100	30
Banana	1	100	105
Orange	1	110	62

CONCLUSION

In this paper, we proposed a measurement method that estimates a number of calories from a food’s image by measuring the volume of the food portions from the image and using nutritional facts tables to measure the amount of calorie and nutrition in the food. As we argued, our system is designed to aid dieticians for the treatment of obese or overweight people, although normal people can also benefit from our system by controlling more closely their daily eating without worrying about overeating and weight gain and identifying food items in an image using image processing and segmentation, food classification using SVM, food portion volume measurement, and calorie measurement based on food portion mass and nutritional tables. An obvious avenue for future work is to cover more food types from a variety of cuisines around the world. In addition, more work is needed for supporting mixed or even liquid food, if possible.

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