

Food Calories Estimation Using Image Processing

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Abstract: *One of the most difficult aspects of obesity therapy is determining how much food obese individuals consume on a daily basis. A computer vision-based approach is used in this study to estimate calorie consumption from food photographs. Propose a Food Recognition System (FRS) for the calculation of calories and nutrient values. The system next analyses and categorises the photos to determine the type of food and portion size, and then uses that information to calculate the calories in the food. In today's food identification applications, emerging food categorization methods are critical. A new food recognition algorithm is provided for this purpose, taking into account the shape, colour, size, and texture features of the item. A better classification will be attained by using various combinations of these features. Dietitians can use this food calorie and nutrition assessment method to track and control their daily food intake. The texture, shape, and size properties of the food image are then retrieved using the CNN. The better the classification, the more accurately the calories of the food may be estimated..*

Keywords: Convolutional Neural Network, Calorie Measurement, Pre-processing and Feature Extraction, Web application

I. INTRODUCTION

Obesity and being overweight have become increasingly common in recent years, and it is now recognised as a major public health concern. Similarly, the World Health Organization (WHO) reported that the global obesity rate has topped one billion people, with the possibility of reaching 1.5 billion. Obesity is generally characterised as an increase in the amount of fat cells in a person's body. As a result, obesity causes a variety of chronic disorders, including diabetes, sleep apnea, ischemic stroke, coronary heart disease, kidney and gall bladder disease, and breast and colon cancer. Researchers are more interested in finding a cure for obesity, and the findings reveal that obesity is caused by a loss of balance in the amount of energy consumed by humans. Some researchers developed the calorie balancing method with the above issues in mind. It will be beneficial to control obesity and overweight if we can balance the calories in the human body. Obesity and overweight are the primary causes of calorie and nutrient imbalances. A calorie is a unit of energy that represents the amount of energy that food supplies to the body. To function effectively, the body need calories.

Obesity and being overweight have become widespread worldwide, and it is now considered a major public health issue. Researchers have attempted to remedy the current situation by introducing several approaches such as a calorie measurement system. As a result, we can maintain good health and fitness by counting calories. Using technology to recognize fruits and estimate their calories is a great way to spread food culture and knowledge among people in an age where obesity is rampant owing to poor eating habits and a broad variety of unhealthy foods.

II. LITERATURE SURVEY

For treating individuals impacted with stoutness, specialists proposed a framework in which they distinguished different food things utilizing the course of division by applying the Gabor channel and thus characterized them utilizing SVM. Gabor Filter is a channel of a straight kind explicitly utilized for surface examination, implying that it checks for a particular recurrence content in the image in specific bearings in a limited area all through the point. The dietary benefits of the food things were determined based on the part of food planned comparing to the sustenance tables. Likewise, for the assessment of the piece of food things, a thumb was set with every food thing while at the same time snapping the photo so that it's without difficulty for the calculation to gauge the life-size parts of the food things which brought about an exactness climb to about 86%.

Another food acknowledgment and calorie estimation strategy that was proposed by Turmchokk sam et al. Involves a one-of-a-kind mix of dietary information of food notwithstanding food temperature and brilliance levels data caught by the warm as well as a CCD (charge coupled gadget) camera. This association of equipment working with the product figured out how to give them more precise results than the other conventional strategies for food acknowledgment.

A framework was created by He et al. named Diet cam to beat the difficulties that emerge with the intra class varieties while doing food recognition. It principally has two primary pieces: fixing recognition and food arrangement. To start with, the program examines for every one of the fixings in the food things by exploiting surface confirmation and a section based model. Second, it classifies the food things with the assistance of amulti-viewmulti part Support Vector Machine or SVM. They utilized Diet Cam on 15262 pictures of around 55 different food classes and got incredible precision on food things that comprised of a few components. M. A. Subhietal did a study and investigated a few customary practices in addition to a few brain networks with the end goal of food acknowledgment and supplements assessment yet reasoned that assessing the volume of the food is as yet the most difficult interaction. SVM and MLP have been brought into execution utilizing MATLAB to obtain positive outcomes

Technique was created in the mid-1950s by Lifson and McClintock in 1966. DLW was broadly utilized for quite a while in estimation issues connected with dietary admission studies to assess energy consumption. Biro, G. et.al created 24-hour dietary review technique is essentially implies a meeting. In this strategy the coach solicitation to client or patient to retain the subtleties of natural product utilization and keep up with the records of unique individual on paper at each 24 hours.

III. PROBLEM STATEMENT

The problem can be simply stated as, given a set of food images with the food name and an unlabeled set of food images from the same group of food, identify food and predicts the calories intake human can get after having a particular food.

IV. PROPOSED SYSTEM

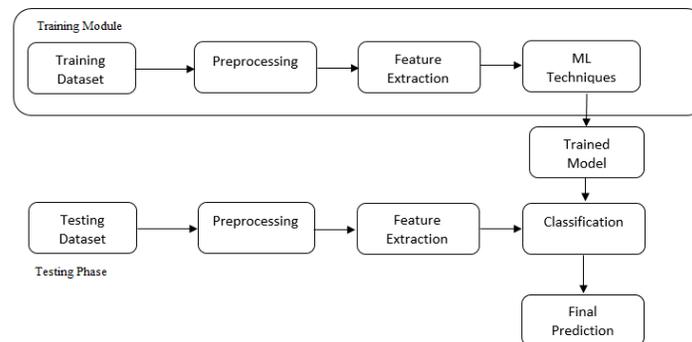
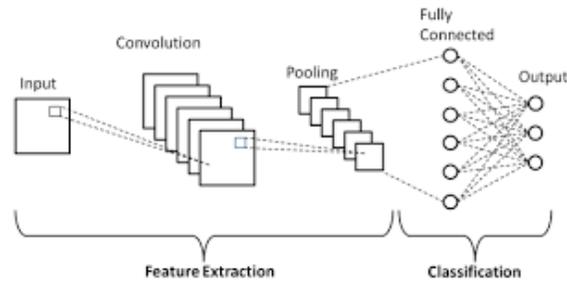


Figure: System Architecture

The proposed system is bulid in python using techniques of CNN, The system will be able to predict the gesture such as which alphabet or number the person is trying to say. Following is the methodology used in proposed system

- The image data were collected from kaggle.
- The collected dataset is divided into 2 parts. i.e :- 80% for training and 20% for testing
- Various Techniques like preprocessing , feature extraction are applied
- CNN was used for classification
- Web application is been developed using php and bootstrap for frontend and Python for backend.
- The user captured image is passed and captured images feature are extracted.
- Extracted Features will be matched with the trained model , depending on nearby match the predicted output is been obtained

4.1 Algorithm Used CNN



4.2 Why CNN?

- CNNs are utilized for image classification and recognition of its high precision.
- The CNN follows a various leveled model which deals with building an organization, similar to a pipe, lastly gives out a completely associated layer where every one of the neurons are associated with one another and the result is handled.
- Henceforth we are involving Convolutional Neural Network for proposed framework

V. EXPERIMENTAL AND RESULT

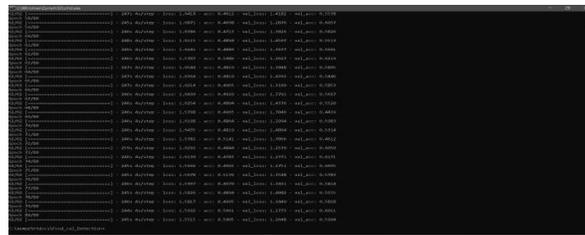


Figure: Training Code

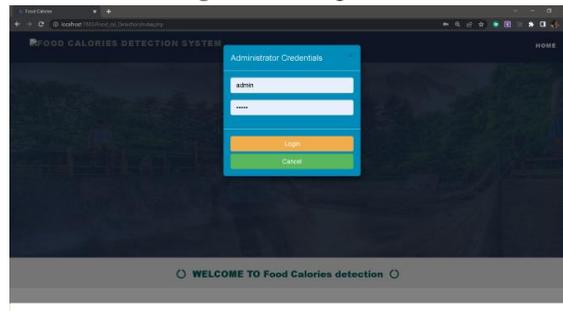


Figure: Login Page

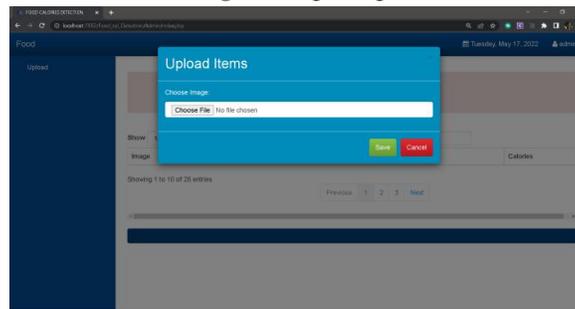


Figure: Upload Image Page

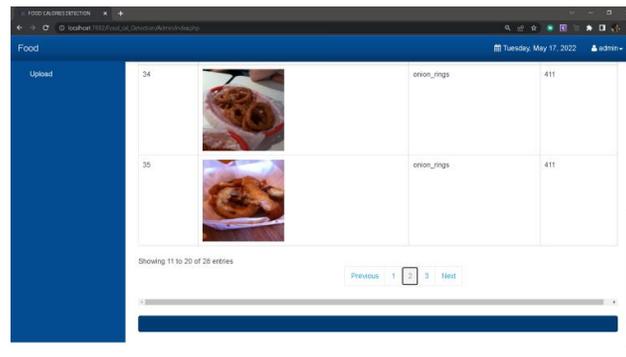


Figure: Prediction

VI. CONCLUSION

We conclude that it is possible to achieve nearly automatic recognition and feature extraction of food image. The framework is to have a system for food image recognition completely on the basis of shape, texture, size. Several food recognition techniques are developed based upon colour and shape attributes. Hence, using colour features and shape features analysis methods are still not robust and effective enough to identify and distinguish food images. A new food quality determination system has been proposed, which combines four features analysis methods: texture-based, shape-based and size-based in order to increase accuracy of recognition in a faster way. The proposed method can also classifies and recognizes food images based on obtained feature values by using this method.

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The heading of the acknowledgments section must not be numbered.

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