CALORIES PREDICTION BASED ON FOOD IMAGES

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Abstract – *Calories calculation in food is now a common task. We use a machine-learning-based approach to predict the calories from food images. Our system only require an image of the food item. First, the type of the food item in the image is identified. Second, the size of the food item is estimated in grams. Finally, by considering both the phases of output, the amount of calories in the food item is predicted. These three phases are based on supervised machine learning.*

1. INTRODUCTION

Previous attempts were made to predict the amount of calories in a food item, according to our knowledge, none of these previous attempts obtained such high accuracy as the one we obtained .For the dietary assessment, image-analysis based approach to calorie content estimation is using in this application. Food Log is called by the use of daily food images captured and stored by multiple users in a public Web service .Without any control or markers images are taken of .By the experts in nutrition, which have been estimated that we build a dictionary dataset of 6512 images contained in Food Log the calorie content. To the ground truth data an image is compared. Multiple image features such as color histograms, color correlograms and SURF features, and the ground truth images are ranked according to the similarities. Finally, calories of the given food image is computed by linear estimation using highly ranked calories that are featured in multiple images. This study helps us to determine the accuracy of calorie content in food images, and to help identify and quantify sources of bias and remove extinct noise as a function of respondent characteristics and food qualities.

2. IMPLEMENTATION

Implementation is the process of setting a plan into action. The objective of this renovated system that has been tried and tested into operation while holding costs, risks, and personal irritation to the minimum. One of the main aspects of the implementation process is to make sure that there will be no obstacle in the flow functioning of the organization. The best course of action to gain control while implanting any new system would be to use well planned test for testing all new programs. Before the production files are used to test that must be created on the old system, copied over to the new system, and used for the initial test of each program.

Another aspect to be made sure before implementation process is to combine phase hardware and software. Once the software is developed for the system and testing is carried out, it is then the process of making the newly designed system fully operational and consistent in performance.

 The most crucial stage in achieving a successful system and giving the user's confidence that the new system is workable and effective is called Implementation. Existing one can be replaced by implementation of a modified application. This type of conversation of this statue relatively easy to handle, provide there are no major hurdles in the system. Another factor is the acquisition of the hardware and software. Once the software is developed for the system and testing is carried out, it is then the process of making the newly designed system fully operational and consistent in performance.

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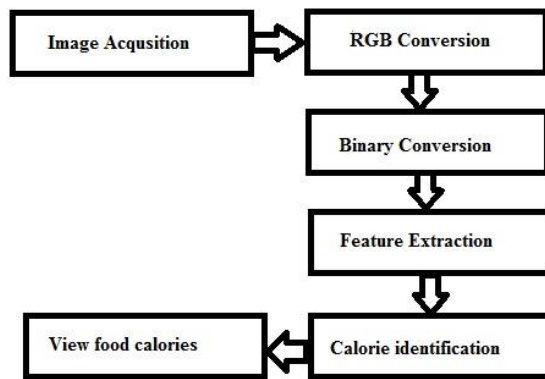
Fig -1: Methodology

Image Preprocessing:

In this module, the first degree of the content identification is image pre-processing that is done with the assist of the cropping, clipping and different procedure. Before processing the photograph need to be converting into the grayscale image because it affords the better results when in comparison to the coloration picture processing.

Image Segmentation:

In this module, the subsequent level is photograph segmentation which is the process of walls an picture. It's the procedure of section the same attributes into photo that's performed with the assist of the K manner type approach.

Feature Extraction:

In this module, the next stage is feature extraction. The dimensions invariant characteristic transform is used to derive vital functions from the segmented region. The approach retrieves the feature in line with the relative function because it does no longer exchange from one photo to some other image.

WORKFLOW

1. Firstly, upload an image. Image accretion is a process of encoding the digital representation of the visual characteristics of an object, such as a physical scene or the interior structure of an object. The obtaining could be as straightforward as being given a picture that is as of now in advanced structure. By and large, the pictures obtaining stage includes pre-processing, for example, scaling. that upgrade is an emotional territory of picture handling. It is a zone that likewise manages improving the presence of the uploaded images.

2. Refining: Without the damage of the true edges , refining is used to remove the noise as possible of the image. It's usually used to refine the image or to reduce noise. .For "unsharp masking", you can use two of them and subtract. The Refining alone will blur edges and reduce contrast.

Gray scaling: The image is converted into grayscale by converting R G B values in the image. Change of a color picture into a grayscale picture comprehensive of notable highlights is an entangled procedure. The loss of contrasts, sharpness, shadow, and structure of the shading pictures are due to the change over the grayscale picture. To save contrasts, sharpness, shadow, and structure of the shading picture another calculation has proposed.
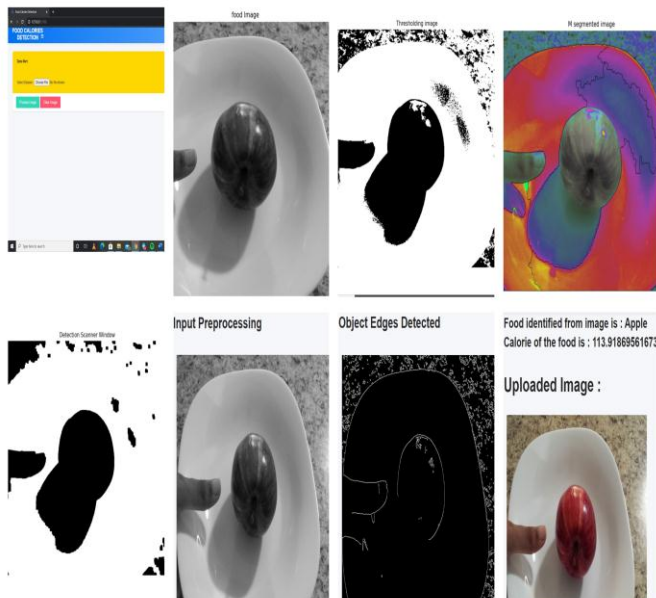
Binarization: Conversion of a grayscale image to white and black. Reducing the information 256 shades of gray contained within the image to 2 black and white. The procedure of binarization works by finding a limit an incentive in the histogram – a worth that adequately partitions the histogram into two sections, each speaking to one of two articles. In this setting it is known as worldwide thresholding. Here's a case of a plane spotters card from WW2 (left), threshold utilizing Otsu's calculation.

3. Segmentation divides an image into various regions containing each pixels with similar attributes. To be of use at some capacity for image analysis, the regions should strongly relate to depicted objects or features of interest. We utilize the Mask CNN engineering for featuring the outline lines at the pixel level. It is a natural expansion of Faster CNN, which creates jumping boxes of identified articles in the picture and arranges each jumping box. It includes a branch for creating parallel pixel-level division covers on each District of Interest (ROI) by utilizing a without quantization RoIAlign layer that loyally deciphers between the compacted RoIs also, their unique arranges in the picture. These progressions bring about a considerably more strong and adaptable design proficient of item location, however object division. We can just adjust the information input pipeline and hyperparameters and utilize the remainder of the model with no guarantees.

4. Feature extraction: Builds derived values (features) that are intended to be informative and non-redundant. It facilitates the subsequent learning. It leads to better human interpretation and dimensionality reduction.

5. Comparision: The feature obtained are compared with dataset. To additionally assess the presentation of the created dataset, the pictures utilized to contrast with train dataset which forecasts and the judgments of calories .Having building up a naming framework, we trained dataset with satisfactory required involvement with recognition to settle on a referral choice on each case utilizing just the fundus picture autonomously.

6. Prediction: once the test data set is compared with train dataset and after its process we come into prediction where Prediction model is built using machine learning which tells you the calories and food type

3. CONCLUSIONS

A try is made to count on the calorie price the usage of Fuzzy c-technique clustering for segmentation and morphology to extract the form of the photograph. The device is designed to help dieticians and nutritionist for the everyday food consumption. The future work pursuits in also creating a cellular software to degree the calorie price of blended elements.

The project tackled the problem of predicting the amount of calories in food items based solely on their images. We adapted a Machine learning approach that first predicts the type and size of the food item in the image, then uses this information in addition to achieve this project. The visual features of the image to predict the total calories in the food item. All our prediction tasks were performed using supervised machine learning, which was based on a carefully annotated dataset of food images.

FUTURE ENHANCEMENT

In future we can create android application that user can use any ware at any time. We can extend our dataset to include more food types other than we experimented here for the further future work. Moreover, we can extend our dataset to include more diverse images with different settings such as the backgrounds or serving surfaces and study the effect of such factors on the prediction performance. We can develop an app in android/ios smart phones. Hence we can predict calories using smart phones.

ACKNOWLEDGEMENT

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