A Self-Monitoring Approach For Nutritional Assessment By Image Recognition Using Android App

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Abstract - Measuring of food values through photo has become a challenging task for the people especially during a large meal. Food mainly depends upon cuisines, cooking style and lack of food knowledge about the food item. However, the contextual knowledge can be crucial to improve recognition in such a scenario. For this purpose we a using a new algorithm by using its size, shape, color and texture characteristics to know respected nutritional and calorie values which are shown whenever the image of the food item is clicked. Thus it helps to focus on food image taken in social context, which helps in providing automatic annotation and retrieval of nutritional and calorie values for particular food.

Keywords - Food Recognition, Image Recognition, Calorie Estimation, Nutritional Values Estimation.

1. Introduction

In recent years, conscious about health has increased depending upon individuals. Many mobile applications are used for recording everyday meals has been released so far. With development of recent technologies, such as smart phones, food related applications. Health monitoring has widely increased and self-monitoring of diet has been effective for changing food habits and which helps in loose weight. In order to realize these applications food directly in images is highly desirable. How un restricted food recognition is still as extremely challenging even for human eyes based on visual information. This paper mainly focuses on restaurants when taking photos of food used to retrieve nutritional values or any information on our interest.

2. Related work

In [1,3,4] Image-Based Food Calorie Estimation Using Knowledge on Food Categories, Ingredients and Cooking Directions, this paper focuses on Regarding food calorie estimation, a lot of approaches have been proposed so far. The main approach is to estimate calories based on the estimated food category and its size or volume, which is a quite standard approach. Since food calories strongly depend on food categories and volumes, this approach is effective and important. In [2,5.6] Snap, eat, repEat: a Food Recognition Engine for Dietary Logging, this paper focuses on The main goal of this work for context-aware recognition is to ascertain the performance of visual models when recognizing real-life pictures of foods, versus idealized menu pictures.

3. Existing system

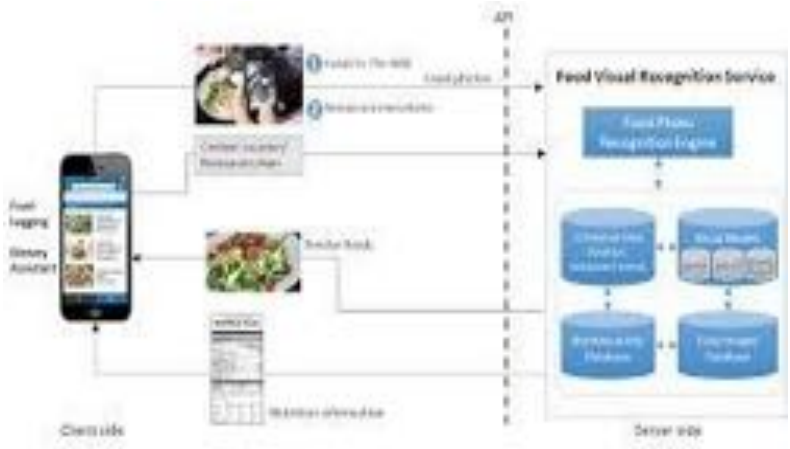
Several existing works do use computer vision algorithms but only work in laboratory conditions where the food items are well separated and the number of categories is small. Furthermore, most of these methods use traditional, hand-crafted visual features, and only use machine learning at the classification stage. Several previous approaches rely on an expert nutritionist to analyze the image offline i.e., at the end of each day. Some of the disadvantages with the existing system are They were tedious and time consuming and Computation was high the processes were slow.

4. Proposed System

In the proposed system we utilize several deep learning algorithms, tailored to run on a conventional mobile phone, trained to recognize food items and predict the nutritional contents meals from images taken. We refer to this task as the conversion of image problem, by analogy to the recent line of work on the conversion to text problem. It should be stressed, however, that we are interested in estimating various properties of a meal (such as fat and carbohydrates) and not just calories. The proposed methodology consists of three main steps: First, we develop a system that can recognize the contents of a restaurant meal much more accurately and at a much larger scale. Second, we introduce a new dataset and show how it can be used to train and test image tagging and segmentation systems. Third, we show some promising preliminary results on the challenging problem of mapping image to calories from images taken in the wild, in a non-restaurant setting.

6. System Architecture

Figure 1: System Architecture of food Recognition system



In Figure 1 It illustrates the architecture of food recognition system. This proposed system mainly consists of two components called client side and server side where Application Programme Interface (API) acts as interface between two components i.e., client side and server side. Client side is responsible for sending the information to the server side and following actions are performed . The photo of the the image should be taken compulsory. When the snapshot of food is clicked it will differentiate into two categories, firstly however the image can be shot randomly in any location. Secondly whether the food item is present in particular Restaurant. Based on the information it is send to the server side such that each API request coming from client is managed. API requests on server are stored as a database of restaurant chains, with their menu items, a nutritional information database containing caloric information associated with known menu dishes, a reference set of food images, on top of which the visual recognition models were built, a set of visual recognition models: one to filter non- food images, one for each known restaurant chain, and one for recognizing foods in the wild.

7. Mobile app

The complete system is shown below. We have ported the restaurant detector, meal detector, and food detectors to the Android mobile phone system. The app can classify any image in under1 second. The memory footprint for the model is less than 40MB. However, we have ported the segmentation or depth estimation algorithms. To use the app, the user takes a photo and then our system processes it. First the system determines if the image contains a meal, and if you are at a known restaurant. If so, it applies the multi label classifiers. We sort the possible labels by their predicted probability, taking all those above, and then truncating, if necessary. We then show these labels. The user can dismiss any labels that are incorrect. He/ she can also enter new labels, either by selecting from a pull-down menu, entering free text. The user's image and labels are then optionally stored in the database for subsequent offline model retraining (although we have not yet implemented this).

8. Results and snapshots

In the complete system we have ported the restaurant detector, meal detector, and food detectors to the Android mobile phone system. The app can classify any image in under1 second. The memory footprint for the model is less than . However, we have not yet ported the segmentation or depth estimation is done. To use the app, the user takes First the system determines if the image contains a meal, and if you are at a known restaurant. If so, it applies the multilabel classifiers and classifies the image based on which it displays the location by giving its respected place values. And also it displays the its calorie values when the image is uploaded by the phone gallery or when the photo is taken by the phone camera and this is shown is below diagrams.

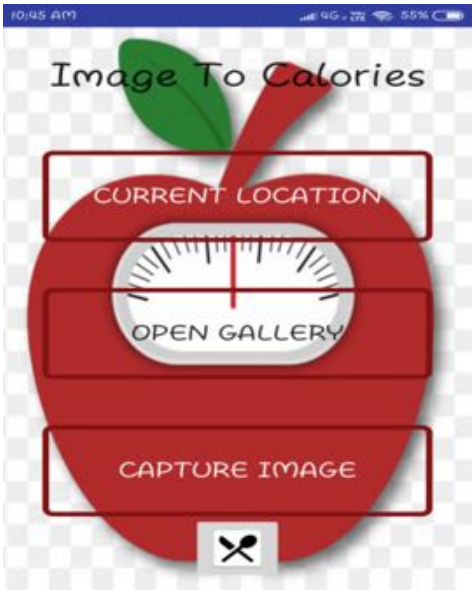


Figure2:The android App of ImageToCalorie

Figure3:Displaying of the location of the restaurant

Figure4:upload the food image

Figure5:Displays the nutritional contents

9. Conclusion

However 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 color and shape attributes. Hence the proposed method can classifies and recognizes food images based on obtained feature values by using this method.

10. References

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