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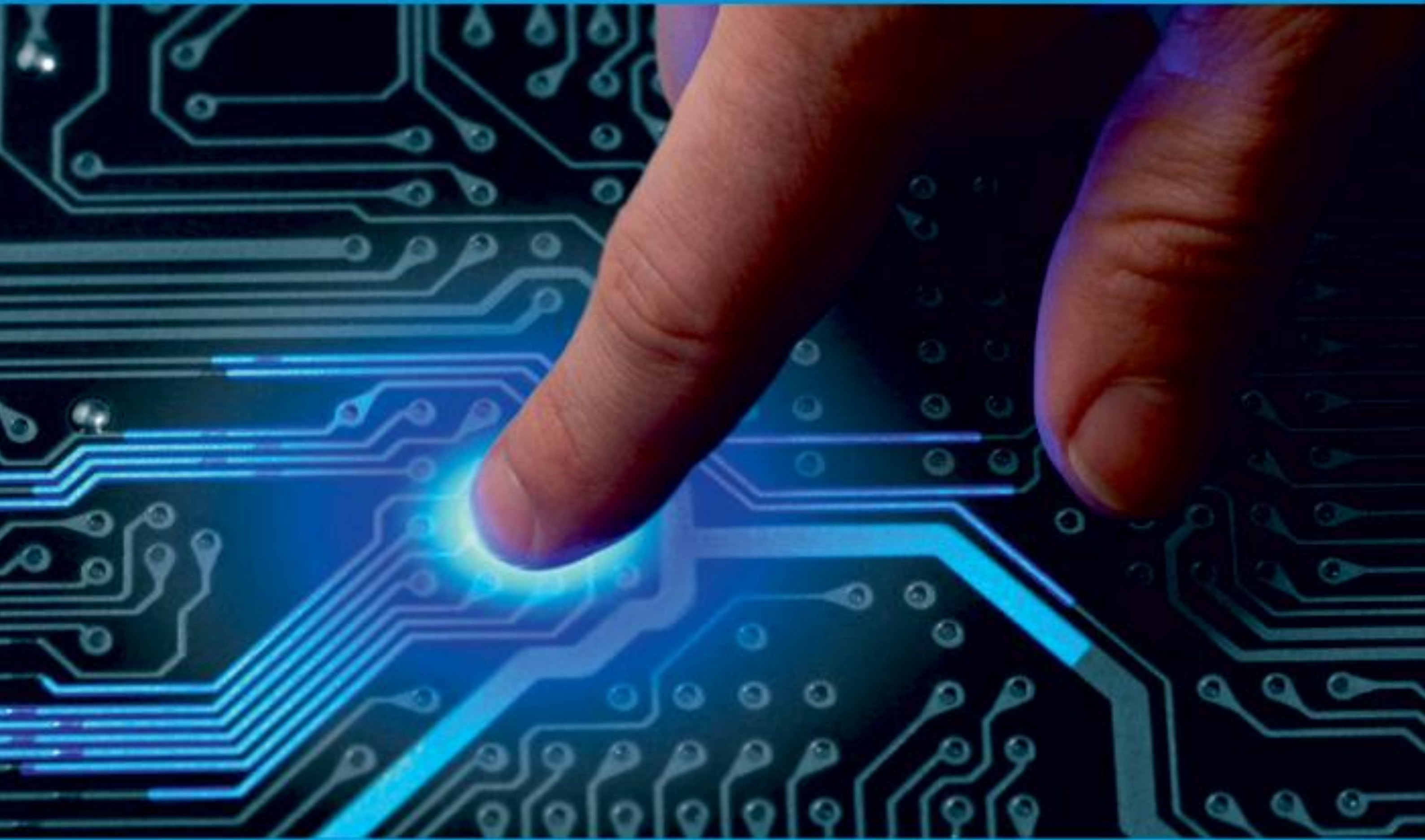

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Survey on Mydietitian-Monitoring of Dietary Habits by Maintaining Calories Count through Image Processing

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ABSTRACT: Today people are more concerned about their daily calorie intake, as it creates several positive or negative impacts on the health based on its proportion. An unbalanced diet may cause many problems like weight gain, obesity, diabetes, high cholesterol, and heart attack. Even though the people can record their meal and discuss it with doctors or experts, it is not so convenient and they cannot know the number of calories before the meal.This system presents an effective way to measure and manage the daily food intake of the user. From the input food images, the users can understand the amount of calories they will take in each meal by using the Support Vector Machine (SVM) algorithm. The system uses several features like FCTH and CEDD that deals with the extraction of a new low level feature that combines, in one histogram, color and texture information. This features FCTH - Fuzzy Color and Texture Histogram and CEDD - Color and Edge Directivity Descriptor helps for appropriate retrieving images even in distortion cases to classify the food images. Based on the calorie count system recommend the user to keep body profile like fitness, reduce weigh or increase weight.

KEYWORDS: fication,Calorie-Calculation, Calorie, Consumption,Daily Intake, Support Vector Machine (SVM), Image-Processing, Fuzzy Color and Texture Histogram (FCTH), Color and Edge Directivity Descriptor(CEDD).

I. INTRODUCTION

A daily diet is very necessary for day to day life. The food gives nutrition to our bodies to provide information to function properly. If we will not get the precise data our metabolic progressions grieve and our fitness decays which cause various health issues. An unbalanced diet may cause many problems like weight gain, obesity, diabetes [1]

[7] so it is necessary to manage our daily food item intake. Calorie and Nutrition measurements are used to monitor body fat as they generate energy. But if we are taken in the excess quantity it gets stored in the form of fats, thus making us overweight. Every age group may differ calorie requirements from that of a child to an adult. Detection of food ingredients from their image is a key process in calorie measurement systems.
Again Food recognition or classification is a challenging task as there are a large number of intra-class variations in the food items. Again same food can have multiple visual appearances that make it more complicated for its recognition and estimate calorie from a given image of the food item. The dietary assessment system gives an efficient way for a person's food intake.

Nutrition might be unable to know the number of calories in each meal. Although they can ask experts to identify the number of calories, it is not convenient and they could not aware of the number of calories before the meal. Here efforts are made to implement a system that can help to detect the number of calories in each of the food items consumed at different times like breakfast, lunch, and dinner using image

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II. RELATED WORK

Ankita A. Podutwar et al.[1] provides a Food Recognition System for Calorie Measurement. Here users just take a picture of the food image then recognize the image to detect the type of food portion and classify using a support vector machine. Segmentation, food portion recognition using skull stripping and classification using support vector machine are used to calculate the calorie along with the type of energy inaccurate way.

Natta Tammachat et al.[2] presents a technique of image processing to recognize images of Thai food taken by users. From the input food images, the users gets the calory count in every meal by using the proposed algorithm. This technique generate feature vector using different features about texture and color, then classify the food images using SVM. The system can detect the food type and the number of calories. S. Jasmine Minja et al.[3] presents a dietary management system that calculates the calorie value of every food item. FCM algorithm is used here for segmentation and Sphere Shaped SVM classifier is used to classify the segmented food items. This method automatically identifies the food items with 95% accuracy and then calculates their calorie value.

An effort has been taken by David Joseph Attokaren et al. in [4] to classify the images of food for further diet monitoring applications using convolutional neural networks (CNNs). As the CNNs is able to handle large amount of data and can calculate the features automatically, they have been utilized for the task of food classification.

The standard Food-101 dataset has been selected as the working database for this approach. Anita Chaudhari et al.[5] develop an application for estimating nutrition calories and improve people's consumption conducts for health-care using CNN, which runs on mobile devices. A Fruit image dataset is used for capturing multiple images of a particular fruit, applied Convolutional Neural Network to the identification of 20 fruit objects, and calculated its presentation. After recognition, the algorithm fetches the nutrition values of the detected object and display it to the user.

Giovanni et al.[6] addresses the study of food image processing from the perspective of Computer Vision. The author used the texture-based representation of food images and introduce new dataset UNICT-FD1200d for the study of food image representation. Parisa Pouladzadeh et al.[7] introduce FooDD: a Food Detection Dataset of 3000 images that offer a variety of food photos taken from different cameras with different illuminations. Graph cut segmentation and deep learning algorithms are used for food detection. A dataset comprising 3000 food images is used for the classification of the food. Good distribution of single and mixed food images is one of the strong features of the given dataset.

Most of today's computer vision methods implicitly assume that all the classes and variations within a class are given in the training images. However, considering a more realistic scenario, only a limited number of training samples or classes are available initially; thus, incremental learning is necessary. In addition, especially in personalization problems, the number of samples from the target domain is very limited. Therefore, domain adaptation and one-shot learning should be considered as well. In this section, we discuss these three concepts related to the personalization problem. We also mention personalization methods used for tag prediction from images uploaded to photo-sharing web sites.

1) Incremental learning: Incremental learning assumes that the number of samples or classes is limited initially and that additional samples arrive sequentially. There are several incremental learning methods: methods based on support vector machines (SVM) [17], [18], [19]; nearest neighbor (NN) or nearest class mean (NCM) methods [20], [5], [21]; and random forests [6]. SVM-based methods suffer from the high retraining costs required to increase the number of classes. Methods based on random forests take less training time than those based on NCM+metric learning or SVM. However, only classwise incremental learning was considered in [6]; sample-wise incremental learning for methods based on random forests still requires long training times. The NN and NCM methods are the most scalable because they can add samples or classes at almost zero cost. However, almost all incremental learning experiments assume that new classes have approximately the same number of samples as the initial classes. They also have difficulty in dealing with changes in class definitions because they treat pre-entered vectors and subsequently added samples equally. Another problem is that their methods use handcrafted features, which show considerably lower accuracy than recent CNN-based methods.

2) Domain adaptation: Domain adaptation is needed when there are variations in the content of classes between source and target domains. There are many domain adaptation methods [22], [23], [24], but most of them cannot learn

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incrementally. [25] and [26] proposed an incremental domain adaptation method for gradually changing domains, but this method does not allow addition of new classes. [16] is similar to our paper in its assumption that test images arrive sequentially; however, its experimental settings are artificial, and the number of classes did not change during the experiments. Incremental domain adaptation for detection tasks has been studied mainly in video recognition, e.g., face detection [27] and pedestrian detection [28], [29], [30]. [31] proposed an image-to-video multi-class incremental domain expansion method, but their method cannot learn new classes.

3) One-shot learning: One-shot learning aims to learn new classes using only a few samples. [32], [33], and [34] conducted their experiments using local or patch-based features. [35] used deep features extracted from pre-trained networks for one-shot scene recognition using a dataset of sequentially changing outdoor scene images. In recent years, deep-learningbased methods have appeared [36], [37], [38]. All these methods encounter the problem that their evaluation methods ignore initial classes when evaluating oneshot learning performance. For the personalization problem, performance on initial classes having rich numbers of samples should be considered as well.

4) Personalized image annotation: Personalized image annotation is studied mainly in tag prediction using image datasets such as the NUS-WIDE dataset [39], which is crawled from Flickr, and the Facebook dataset [40]. Previous studies [2], [3] succeeded in learning user preferences from only a few samples, but they assumed that a large vocabulary was known beforehand, which does not hold in real-world situations. It is also problematic to apply their methods to personalized classification because tag prediction is a multi-label problem.

III. **CONCLUSION**

This system presents an effective way to measure and manage the daily food intake of the user using image processing techniques.for that user first, take the image of the food and then by using the fcth and cedd feature we can detect the type of food using the supportvector machine. the system also provides the calorie count of the captured food item. the system provides details of calories consumed by the particular food and based on that it recommends different body profiles like if the user is fit, needs to reduce weight or increase weight. food and calorie content are shown in the database.

IV.FUTURE WORK

In proposed system ,we can classify the food type like poha, upma or idli. in future we can extends with different kind of food along with calorie count.

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