FOOD CLASSIFICATION AND CALORIE MEASUREMENT USING CNN ALGORITHM

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ABSTRACT: Now a days, people are busy in life they don't follow the good food, they are becoming more sensitive to their diet. Fruits contribute to an main role of the diet, because a major source of energy, proteins, vitamins, fiber, fat, nutrients. The food is a leading step in our daily life. Naturally fruits are low in fat, sodium & calories and potassium and fiber, vitamin C. The proposed system is food classification and calorie measurement, when the user is upload the image the system quickly gives how much of calories, nutrients, vitamins and proteins are present. This system is very useful for managing of daily intake of food, it also figures the weekly proportion of food for balancing of calories to avoid diseases. The user just upload the images then the system will take the images of fruit and vegetables using image processing, segmentation and classification it calculates the calorie content classify using support vector machine, CNN, After classifying the fruit and vegetable, the calorie of each fruit with generally for 100g using standard calories table.

Index Terms: SVM, CNN Algorithms, image classification, calories, fat, proteins, fiber values.

1. INTRODUCTION

Food is very important to a human body. So, there is a need for a diet plan for the estimation of number of calories for the maintenance of a fit and healthy life. In most of the cases people are uncertain and face difficulties in measuring the amount of food intake due to the shortage of nutritional information. t is very useful, if there is a system to measure the calorie's intake. We propose a food calorie measurement system where we can get detail like number of calories, nutrients, vitamins and proteins present in the uploaded image of a food item. This system is used for the detection of the uploaded food image and displaying of the amount of calorie's present in the food through image processing. The image classification is done for the estimation of calories, it plays an important role in measuring of calories. The food recognition becomes the task for calorie estimation for multiple images of dataset, by recognition of food the quality is determined for calorie measurement. The food regions are extracted from the image processing An image is selected from the dataset by the user for determining of the details of food item. Estimation of calories in the food image is important key role of this system which is very useful for the users to maintain their balanced diet. The extraction of the details of the food image is done through the dataset that is uploaded. The image pre-processing is done to obtain the useful information of the food item and provided to the user. The feature extraction of the food image is carried out after image processing such that the user can obtain the relevant information of the required food item.The image classification plays a vital role in the in measurement of calories, the information that is required can be extracted from the classification it is a complex task. Classification of food gives the specific details of food item that is required. The food image selected from the dataset by user is classified for measuring of calories. For recognising, defining, extracting of image features and finally for classifying of food image CNN (Convolutional Neural Network) is used.

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LITERATURE SURVEY

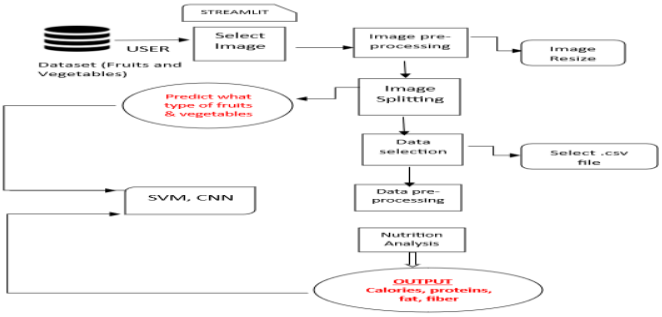
Based on the review "Recognition of multiple food images published by Y.Matsuda. This paper proposed a multiple food image recognises in single image only by detecting candidate regions. In this method first detect the several regions by DPM model using the Fast food finally classification for multi-food and single food also. On analysing of "Food image recognition using deep convolutional network with pre-training and fine-training published by K.Yanaithese methods are using DCNN pre-trained gets large scale image net data in this technique trained the 200 categories of food images it gets high classification accuracy using the DCNN in 0.03 sec it classify the one food photo with GPU.In mostly Food image recognition using deep learning techniques only on taken as fast food dataset only and using different techniques classifies the food image only some approaches based on the specification of google image recognition also. The end-to-end most of the using in research deep learning is more accurate it is able to resist such as changes in image pre-processing, feature extraction, segmentation of the food image "Wide-slice residual networks for food recognition" is new challenges of the computer vision algorithms.in case particular food prepared in different ways provides a to capture the food images and its recognises and then calorie estimation."Food-101 mining discriminative components with random forests" published by Lukas Bossard is introduce novel method to mine of discriminative parts using Random Forests this paper uses a dataset food -101 using the methods except for SVM and CNN on improved on part-mining algorithms and then images classification. Using SVM, CNN algorithms using but dataset is fast food like pizza, noodles, burger etc and recognizes the image classification on different approaches. some of the research papers have done in raw materials but using the only one image classification only. To solve these problems, we propose a image classification on Fruits and Vegetables and calorie estimation. Our proposed method uses patients, dieticians intake of calories food, as proteins, fat, fiber etc.

EXISITING SYSTEM

The existing system uses Ensemble(ResNeX-101, DenseNet-161) are machine learning techniques, the dataset is used as UEC FOOD-100 contains cooked food items like pizza, burger, noodles etc. In this dataset contains single-food item and multi-food item images are used. In this system they are using the DCNN(Deep Convolutional Neural Network) is used for Food Classification.

PROPOSED SYSTEM

The proposed system for Food Classification and Calorie Measurement makes a use of neural network CNN and SVM which is a Machine Learning and Deep Learning approaches. SVM is identify the Image Classification and trains on a set of label data, CNNs are identifies the image classification and recognition, convolutional layer reduces high dimensionality of images without losing its information and its high accuracy. The user upload the image, system will check image pre- processing, dividing the testing and training data then its classification the image, detects what type of image, and finally displays the calories, fat, fiber, protein values.



METHODOLOGY

To accomplish better results we will use a Machine Learning, Deep Learning strategies i.e SVM, CNN to improve the best accuracy level.

Dataset:

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For collecting fruits and vegetables images in data set we have to collect the single fruit and vegetables images into different images, data set is large sized of collecting images and it helps to increase an accuracy of calories done in image recognition of calories measurement.

Pre-processing:

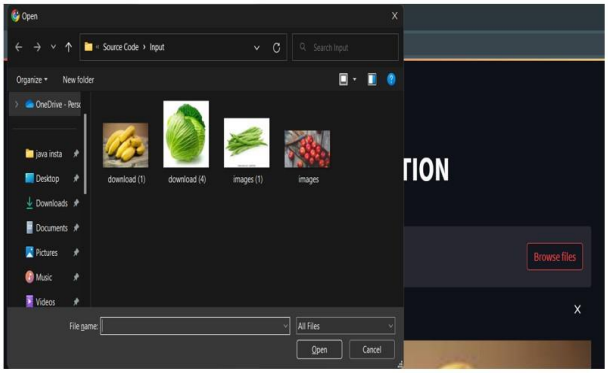
Resizing the image, to improvethe quality of a image so it can analyze in a better way and more accurately and retrieving the noise data and clear the smoothing edges image size fix in a pixel. After completing the pre- processing the data divided the two types testing data and training data.

Image Classification using SVM, CNN:

SVM: Support Vector Machine is supervised learning technique in machine learning that performs a classification of data it involves in a testing and training data consists of data instances, training data contains a label data the goal of SVM is predicts a target value in training data. In this model uses the given information and classification the image what type of food of that image it can predicts the images very easily SVM classifier provides what type of food from image and output is image name.**CNN:** It identifies the image classification and recognition, convolutional layer reduces high dimensionality of images without losing its information. involves the processing of pixel data,It has less pre-processing time, It provides a feature extraction phase with a convolution, classification phase is with fully connected layers and pooling layers also ,it can used for complex issues also.

It has five layers:

- Input layer
- Convolution layer
- Pooling layer
- Fully connected layer
- Output layer



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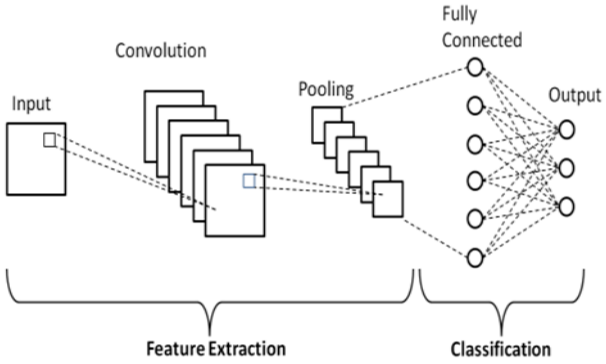
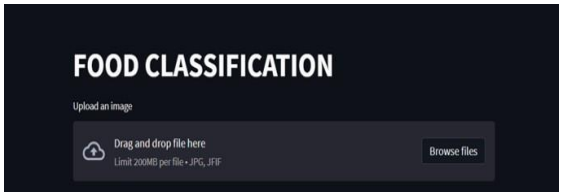
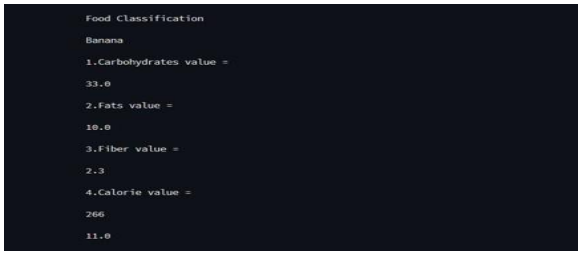


Calories Measurement:
Finally, we have to execute Our main output of this project after classification of image, calories measurement of fruits and vegetables in standard values(l00g). not only calories, proteins, fat, fiber etc.Estimated calories= (Estimated weight*calories weight)/100
Input: Upload the image by user

RESULT
A web application is based on Stream litour trained data is deployed in it. When the user is upload the image, it can identifies the image and classification that image what type of fruit and vegetable and gives a calorie value, fat, fiber, protein values in result as in text format.

EXPERIMENTAL RESULTS





CONCLUSION
We have extracted the image classification from fast food items and successfully showed in the image classification for fruits and vegetables and calories measurement as well as we displayed the fat, fibre, protein values using SVM, CNN algorithm. We achieved a better accuracy comparative to old approaches in literature review. User upload the image as input to the system, quickly classification the image after classification and output is calorie value display it to user. Mainly our proposed system is useful to patients and dieticians to maintain a good healthy life

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