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Survey on Dietary Application through Image Processing for Calorie Management

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Abstract: *"Support Vector Machine" (SVM) is a supervised machine learning algorithm that can be used for both classification or regression challenges. However, it is mostly used in classification problems. In the SVM algorithm, we plot each data item as a point in n-dimensional space (where n is a number of features you have) with the value of each feature being the value of a particular coordinate. Then, we perform classification by finding the hyper-plane that differentiates the two classes very well. Support Vectors are simply the coordinates of individual observation. The SVM classifier is a frontier that best segregates the two classes (hyper-plane/ line).*

Keywords: Support Vector Machine (SVM), Image Processing, Fuzzy Color and Texture Histogram (FCTH), Color and Edge Directivity Descriptor(CEDD)

I. INTRODUCTION

Image Processing (IP) is a computer technology which is applied to image that help us process, analyze and extract useful information from them. We need a daily proper diet to live day to day life. The food we consume gives our body nutrients to function properly. If we do not calculate our daily nutrient intake or do not monitor, it can causes severe health issue. A unbalanced and not calculated diet can create many problem in human life like negative weight gain , diabetes , obesity so it is necessary to manage our daily food item intake.

II. RELATED WORK

- Paritosh Pandey, built an food net recognizing food system using ensemble of deep networks.
- Xin Wang, proposed recipe recognition with large multimodal food dataset.
- Alessandro Ortis, proposed Recognition of food type and calorie estimation using neural network
- Ya Lu proposed Food TM an artificial Intelligence system for dietary assessment.

III. LITERATURE REVIEW

Our proposed system is Diet management application using image processing. In our system we use SVM i.e. support vector machine algorithm for training the dataset and FCTH and CEDD for extraction of data through image. In our system the user has to enter their body details such as weight , height, glucose content which helps the system to suggest diet to specific user. Here, the user has the provision to upload the food image which in return provides with the calorific value of the food item. Various existing techniques and algorithms are described in following table.

Sr No.	Paper Title	Advantages	Disadvantages
1	Food Recognition System For calorie measurement	Accuracy 89 percent reasonable accuracy.	Results are not always optimal as expected
2	Modelling restaurant context for food recognition	Helps tracking of food items	Images will not be uploaded.

345

3	Mobile multi-food recognition using Deep learning	Accuracy of 94 percent. It has Minimum cost and less room for error.	Too much variance in food appearance.
4	Food recognition a new dataset experiments and results	It has an Accuracy of 79 percent.	More time consumed Less accurate
5	Design and implement of ingredient based food calorie measurement	Results better than average statistical data.	Component cost are highly expensive.
6	Deep learning based food recognition system	It stands in top 5 accuracy. Less energy is consumed as compared to other cases	Active network connection is required throughout the process
7	Multiscale Multiview feature for food recognition	It performs the best recognition on best dataset	It does not have perfect accuracy
8	Estimation of protein from image of health drink powder.	It has a good prediction accuracy which is highly acceptable	It requires extra equipment which makes the process less cost efficient
9	Food TM an artificial Intelligence system for dietary assessment	It supports a wide range of food categories	The results were inferior as compared to others.
10	Recognition of food type and calorie estimation using neural network	It has a good accuracy 96.5 percent for support vector machine	Complex food items are not considered.
11	Voting combinations based on CNN for food image recognition	It provides promising results than other cases	This process is less accurate and has less speed.
12	Social media image analysis for public health	It has the most effective process amongst all cases	It has hard rate limit restrictions. It does not have textual tags assigned by user.

Table 1: Literature Review

IV. CONCLUSION

We have studied about Support Vector Machine (SVM) for training the dataset and FCTH and CEDD algorithm for image data extraction. This project can be helpful for calculating daily calorie intake as well as monitoring food type.

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