FOOD IMAGE RECOGNITION FOR MEDICAL PATIENTS.

Prashant Kamble[1] ,Abhijeet Jagtap[2], Shubham Khandelwal[3], Akshay Patel[4]

[1]*Student, Computer, AISSMS IOIT, Pune, Maharashtra, India*

[2]*Student, Computer, AISSMS IOIT, Pune, Maharashtra, India*

[3]*Student, Computer, AISSMS IOIT, Pune, Maharashtra, India*

[4]*Student, Computer, AISSMS IOIT, Pune, Maharashtra, India*

Abstract — *The proposed system is used for food image processing using BoF , image recognition and classification of food could possibly predict necessary dietary assessment required for proper nutrition for medical patients.*

Keywords- Bag of features , feature extraction., k- means

I. INTRODUCTION

Dietary assessment of our day to day meal is important for proper intake of nutrition in food which if ignored causes severe heart diseases and other health problems. We proposed a system which processes food image to give relative nutrition content of that sample. Knowledge library is used which holds predefined datasets of food images. After processing image using feature extraction techniques a statistical image is obtained which gives nutrition values in food.

II. SYSTEM MODEL.

The very first step in model is to load image. Then various images processing algorithms as well as techniques are applied. After this features are extracted which are in turn tested for nutrition values.
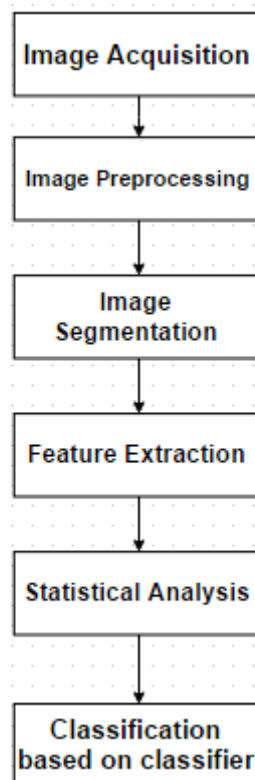

Figure 2.1: Block Diagram of System

III. PREVIOUS WORK

Fuzzy Logic : [2] Fuzzy Logic was used as a classifier but it has low stability issue. In addition to that it is not a systematic approach. Also Fuzzy Logic are used for small number of input whereas it fails to give desired output for large number of input sets.

Support Vector Machine(SVM) : [3] In SVM technique there is mismatch of input data to linearly separated data. The marginal distance between different classes is maximised using SVM . The samples closest to the margin that were selected is known as support vectors. Classifier SVM takes long training time. The learning function in SVM is also difficult

IV. PROPOSED METHODOLOGY

In this paper we proposed system which load food image as an input to the system . This image is then processed by applying algorithms and techniques such as block detection , k-means algorithm for clustering , grey scale conversion, RGB to HSV conversion and the features are extracted from interested regions of food image. These features are applied as a input to Bag of features model. [1] BoF model contains 4 phases : key point extraction , local feature description , learning local visual dictionary, descriptor quantization.

- 1.The first phase is key points are selected on input image that defines center of all local patches where descriptor would be applied.
- Once the key point extraction is done, then a feature vector are produced by applying local image descriptor to a rectangular area around each key point .
- After this phase , k-means algorithm is used for clustering key points.
- In Descriptor quantization feature vector are assignd to the closest visual word of a predefined visual vocabulary.
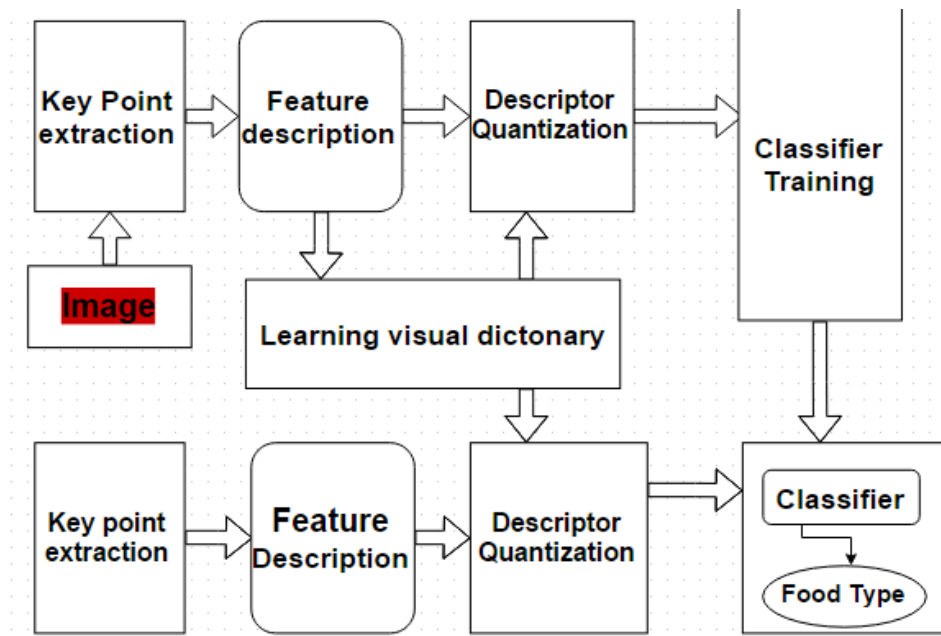

Figure 4.1 Proposed System Model

V . CONCLUSION

Our proposed system is used for dietary assessment for medical patients using Bag of Features and other image processing techniques. For future work can extended for developing applications for embedded systems also for ubiquitous environment. Also client- server approach can be developed by sending image to servers and server maintains algorithms which in turn return results to clients.

VI. FUTURE SCOPE

In future, client-server machines can be implemented for food image recognition.

REFERENCES

[1] Marios M. Anthimopoulos, Member, IEEE, Lauro Gianola, Luca Scarnato, Peter Diem,and Stavroula G. Mougiakakou, Member, IEEE,''A Food Recognition System for Diabetic Patients Based on Optimized Bag-of-Features Model'', IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS, VOL. 18, NO. 4, JULY 2014.

[2]Guo-Shiyang Lin, Tai-Yu Su,Jun-Hong Lin,Yi-Ting Chen, Chan-Han, Ya,Fu-You Li, "An Automatic Leaf Analysis System ",2013 IEEE 17th International Symposium on Consumer Electronics (ISCE)

[3]W.S. Ooi and C.P. Lim," A Fuzzy Clustering Approach to Content-Based Image Retrieval", 2009,Workshop on Advances in Intelligent Computing.

[4] C. E. Smart, B. R. King, P. McElduff, and C. E. Collins, "In children using intensive insulin therapy, a 20-g variation in carbohydrate amount significantly impacts on postprandial glycaemia," *Diabetic Med.*, vol. 29,no. 7, pp. e21–e24, Jul. 2012.

[5] Fanyu Kong, Jindong Tan," Automatic dietary assessment with mobile camera phone", July 2011

[6]Svetlana Lazebnik, Cordelia Schmid ,Jean Ponce, "Beyond Bags of Features : Spatial Pyramid Matching for Recognizing Natural Scene Categories", August 2013.

[7] Dayanand Savarkar,"Recognition and Classification of Similar Looking Food Grain Images using Artificial Neural Networks",2012

[8] Parisa Pouladzadeh, Gregorio Villalobos, Rana Almaghrabi, Shervin Shirmohammadi,,"A Novel SVM Based Food Recognition Method for Calorie Measurement Applications",2012