"ANALYSIS OF COLORED TEXTURE CLASSIFICATION WITH CASCADED SUPPORT VECTOR MACHINE & PARTICLE SWARM OPTIMIZATION"

[1]MISS. SAPANA Y. BIRLA
Patel College of Science & Technology, Ratibad, Bhopal, India
sapan2001@yahoo.com

[2]PROF. PANKAJ KAWADKAR
Patel College of Science & Technology, Ratibad, Bhopal, India
kawadkarpankaj@gmail.com

ABSTRACT: *The classification process of image plays vital role in computer vision and many multi-mediums and dominated image analysis process. The increasing rate of multi-media data increase the utility of content based image classification. Content based image classification used in different field such as multimedia search in online application, automatic medical diagnose ,video classification and annotation and many more field in current scenario. The performance content based image classification basically depends on lower content of features of image database. now a days in current research trend researchers focus on the high-level semantic investigation of the image content along with the visual content of the image such as colors, textures, and shapes Feature selection and feature optimization play vital role in content based image Classification. The optimized feature of database image improves the searching capacity of content based image classification. In current research trend various method of feature selection and feature optimization are used such as particle of swarm optimization, genetic algorithm and neural network. In this paper proposed a hybrid method for content based image classification, the proposed method is a combination of support vector machine and particle swarm optimization. The extracted feature is optimized with PSO function. In this paper proposed method impalement in MATLAB software and used coral image database. For the empirical evaluation used some standard parameter precision and recall. Our empirical result shows better performance in compression of exiting methods.*

***Keywords*:** image classification, particle swarm optimization, support vector machine

1. INTRODUCTION

Image classification has been a testing research field for quite a long time. Determination and use of low-level visual components is a basic stride in creating compelling classification frameworks, since these elements are utilized to speak to various visual properties of pictures. The low-level visual components can be defined by either worldwide quality in pictures or around the notable picture fixes locally. The worldwide components, for example, shading dispersion or edge histogram, portray the whole substance in a picture; in any case, their use is restricted since they are delicate to imaging conditions, for example, see changes or impediments. The fundamental favorable position of nearby elements over worldwide components is the dependability of the extricated descriptors under various introduction or scale changes, which gives solid coordinating between the element descriptors separated from similar items or scenes. In this way, the exploration field has been moved from learning ideas by utilizing worldwide shading or surface based components to nearby elements created around the premium focuses.

2. RELATED WORK

Yang Hong Et al. [1] talked about a novel iterative-tuning plan to build the preparation speed of the characterization calculation utilizing Support Vector Machine (SVM) learning. Then they determine the conditions to acquire SVM parameters by leading hypothetical investigation of iterative-tuning SVM. Movement order is completed utilizing stream level data separated from NetFlow information. Execution assessment shows that the talked about iterative-tuning SVM displays a preparation speed that is two to ten circumstances speedier than eight other already examined SVM strategies found in the writing, while keeping up practically identical grouping precision as those eight SVM procedures. Within the sight of a large number of streams and Terabytes of information in the system, quicker preparing rates is basic to making SVM procedures a reasonable alternative for genuine sending of activity arrangement modules.

Osama Hosam Et al. [2] presented surface picture classifier in view of wavelet change and Support Vector Machine. Comes about indicated high precision in classification when the shading data is added contrasted with utilizing grayscale pictures in surface classification. They have talked about SVM approach in light of wavelet pyramids for shading surface classification. A correlation between utilizing diverse filters in Wavelet multi determination investigation is presented. It demonstrated that utilizing distinctive filters influences the classification precision. Also, they have presented broad investigation of shading surface classification for each of the RGB shading channels. they thought about additionally the aftereffects of utilizing grayscale picture, R channel, G direct and Blue divert in surface classification, comes about

demonstrated that the precision of classification is expanded when the shading elements are included the division stage.

Liqiang Pan Et al. [3] an element portion based time arrangement order calculation was talked about, which just chooses some very discriminative time arrangement information for grouping. Firstly, a versatile time arrangement division strategy was examined. At that point, a substantial edge based element portion choice strategy was given. In light of these two strategies, a period arrangement characterization system was built up in the wake of speaking to the time arrangement with the ideal fragments. By investigating the discriminative fleeting examples covered up in subsequences of time arrangement and giving them more underline, the calculation talked about in this paper can enhance the time arrangement grouping execution significantly. Broad exploratory outcomes demonstrated that the talked about calculation can accomplish a decent arrangement execution.

3. PROBLEM DEFINATION

The role of image classification is increase day to day in internet technology and in medical diagnosis. The marketing and user behavior depends on the user interest. If the user suffered from accurate and best retrieval of search content of multimedia. User left the technology. How to improve the searching capacity of content based image retrieval is major challenge in the field of computer vision. For the improvement of the process used various techniques of feature extraction and feature optimization. In consequence of feature based content based image retrieval used color feature, texture feature and shape and size feature. Some problem is discussed below.

1. The semantic gap between query image and classified image.

2. The extraction of feature process is very complex and not resolves all feature point in query image and retrieval image.

3. The feature selection function process faced a problem of feature optimization.

4. The process of feature optimization not used precise fitness constraints for the optimization of feature

4. PROPOSED METHODOLOGY

In the proposed work image classification technique based on partial feature extraction technique and particle of swarm optimization technique. The particle feature extraction technique is new method of feature extraction of shape feature.

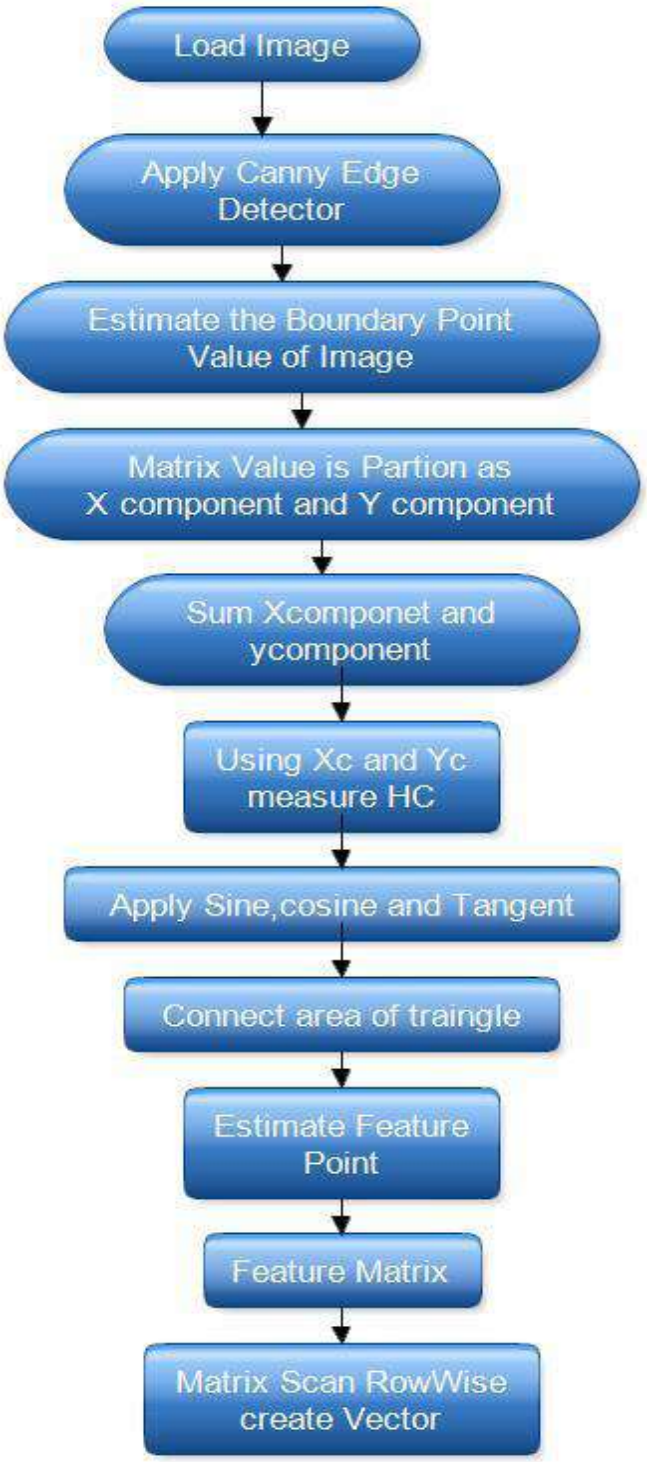

Figure 1: shows that process block diagram of sine cosine and tangent function apply for feature extraction.

4.1 FEATURE SELECTION

The selection of feature play a major role in image classification for the selection of features used various technique such as direct searching technique and heuristic

based technique. In heuristic based feature selection process used genetic algorithm, ant colony algorithm and particle of swarm optimization algorithm.

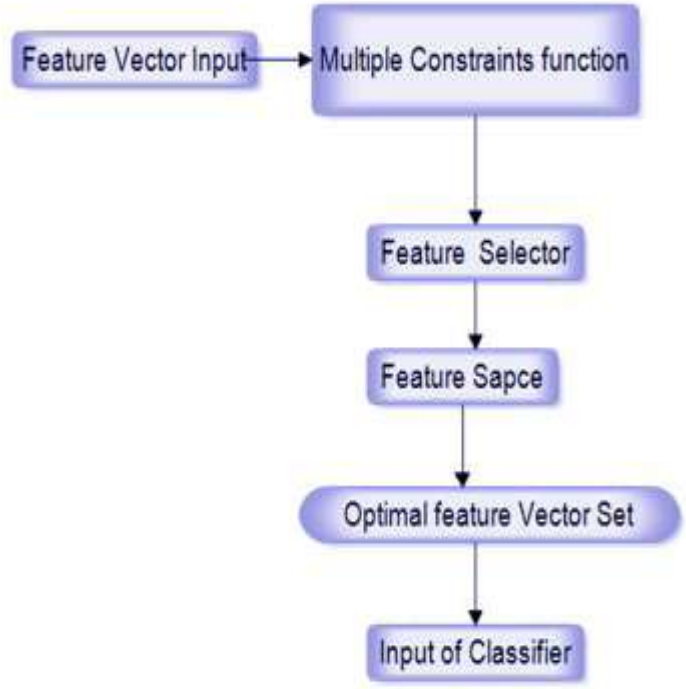

Figure 2: Shows that the process of feature selection for the input of the classifier

5. PROPOSED ALGORITHM

The proposed algorithm is a combination of partial feature extraction and particle of swarm optimization. The partial feature extraction extracts the feature and passes through the feature optimization process is called particle of swarm optimization. The particle of swarm optimization process optimized the feature and passes through support vector machine. The support vector machine classified the image data into different group. The algorithm steps given below.

Steps of algorithm

1. Select data set
2. Apply partial feature extractor
3. The particle feature extracted creates a feature bag
4. Generate process of bagg-off feature
5. Generate feature set
6. Generate distance vector value for selection process
7. Initialized a population set (t=1)
8. Compare the value of distance vector with population set
9. If value of feature greater than vector value
10. Processed for encoded of data
11. Encoding format is binary
12. After encoding of local population.
13. Finally gets the optimal feature.
14. Call support vector machine for the classification purpose.
15. If image is not classified go to selection process
16. Else optimized classified image is generated.
17. Exit

6. RESULT ANALYSIS

To evaluate the performance of proposed method of content based image classification we have use MATLAB software 7.8.0 with a variety of image dataset used for experimental task.

6.1 EXPERIMENTAL RESULT

The experimental result partitioned by two methods one is SVM-DAG and another is our proposed technique SVM -RBF. In SVM-RBF we changed the kernel function of SVM with Gaussian kernel of SVM and here we used the number of neurons 400. For dedicated dataset of image and Feature Matrix of dataset used 3×3 Feature Matrix Vector. One time input of vector is 9 vectors. In this vector contents DCD and TXD features for classification of image. In this experimental set up we used 5 classes of data. Now we design five level classes at classification. Here we find the accuracy of classification according to given formula,

$$Precision = \frac{number\ of\ relevant\ images\ retrieved}{number\ of\ image\ retrieved} \quad \ldots\ldots(1)$$

$$Recall = \frac{number\ of\ relevant\ images\ retrieved}{number\ of\ images\ database} \quad \text{----------}(2)$$

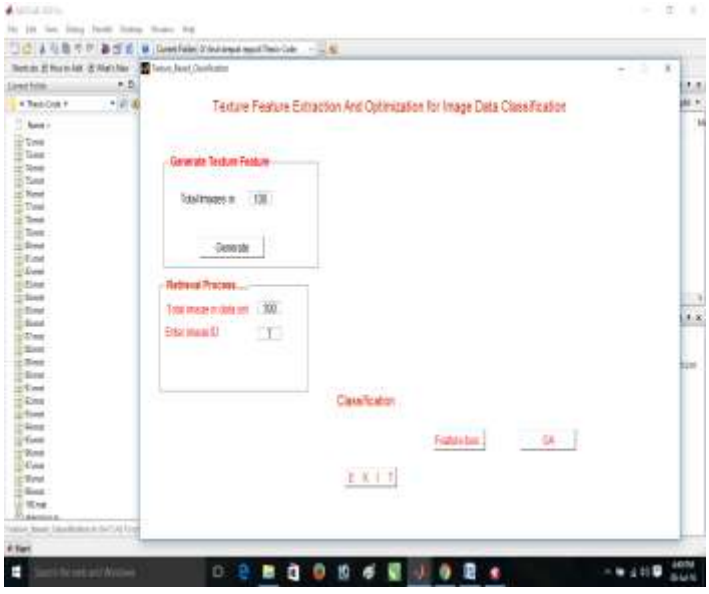

Figure 3: Shows the main window of implementation of image classification.

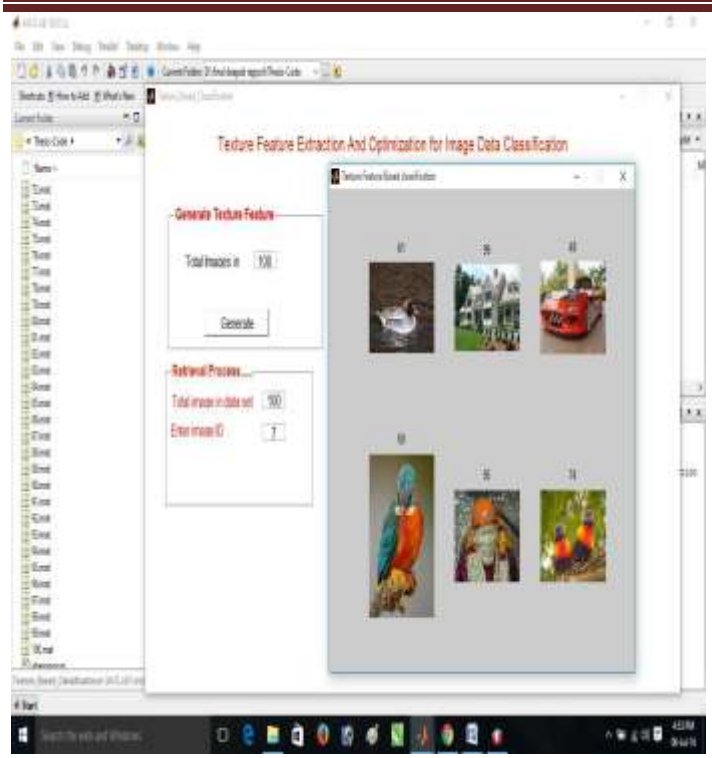

Figure 4: Shows the first classification of Data set1 which includes total 100 images and contains 48 images of car.

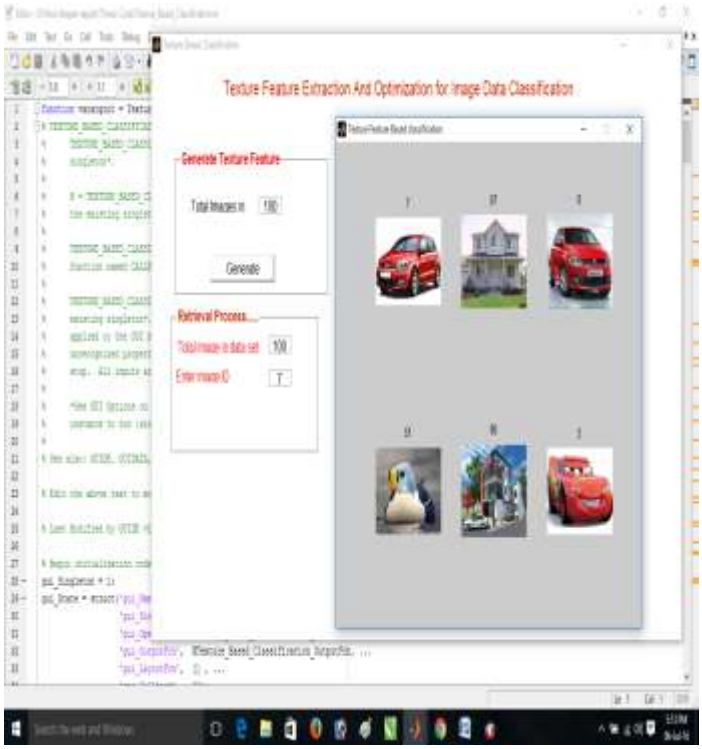

Figure 5: Shows the second classification of Data set1 which includes total 799 images and contains 100 images of flower.

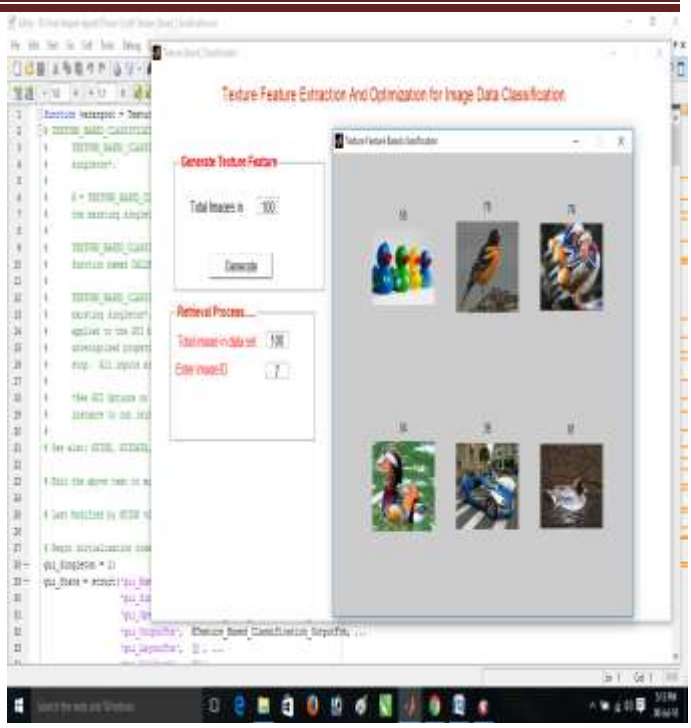

Figure 6: Shows the third classification of Data set1 which includes total 799 images and contains 100 images of flower.

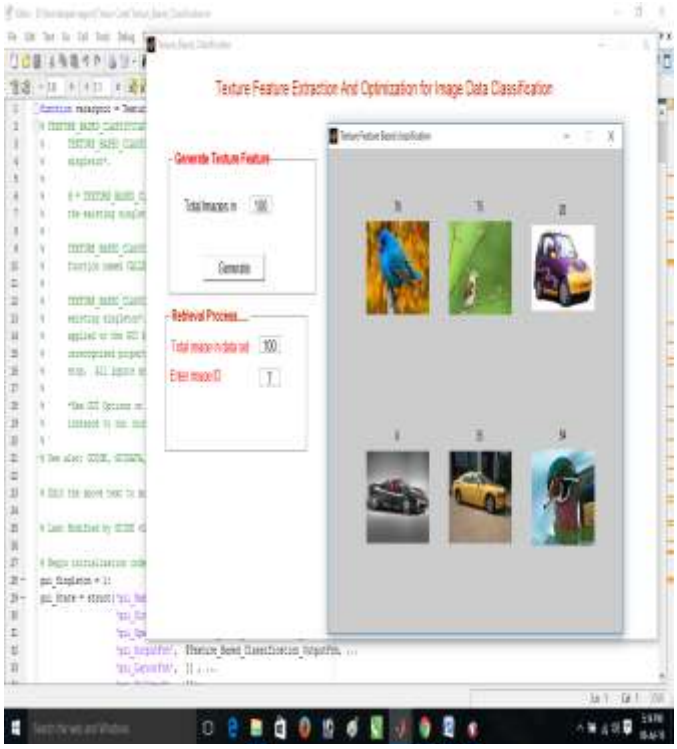

Figure 7: Shows the forth classification of Data set1 which includes total 799 images and contains 100 images of flower.

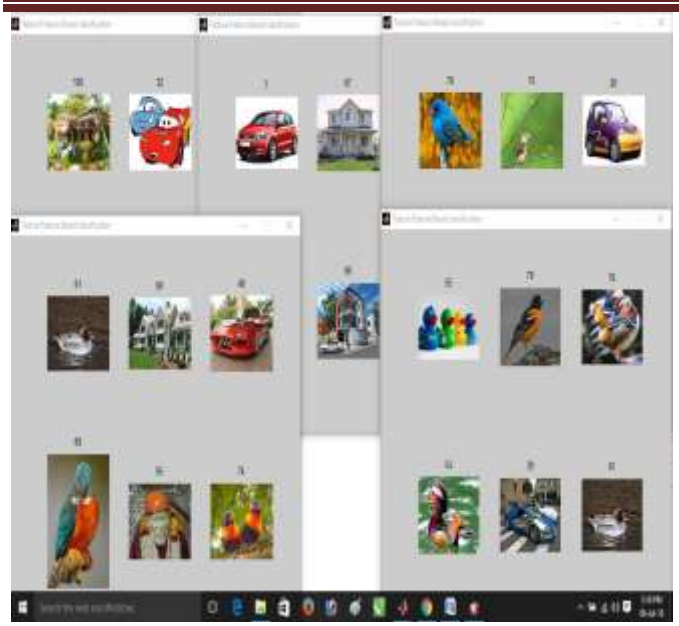

Figure 8: Shows the all five classification of Data set1 which includes total 799 images and contains 100 images of flower and the Precision rate is 86.66 % and the Recall rate is 80.21%.

7. COMPARATIVE PERFORMANCE EVALUATION

Data set Image	METHOD	PRECISION (%)	RECALL (%)
Flower	TFB	86.66	80.21
	PROPOSED	91.33	83.60

The result analysis of image classification based on number of class of image based on two methods. The total number of image in classification window is 500 and count the number of actual recall image in result windows.

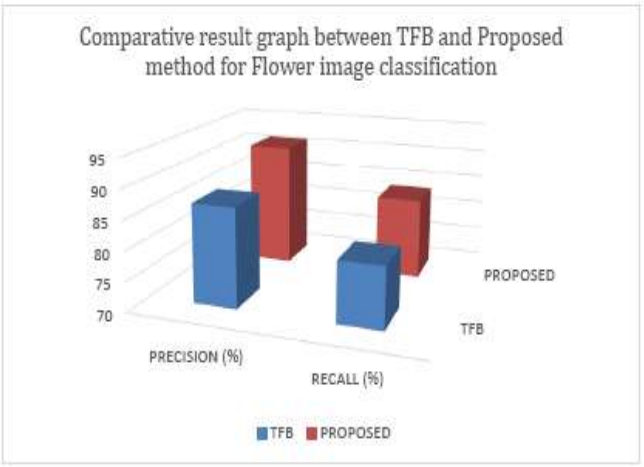

Figure 9: Shows that performance of data set 1 counts of data and rate of precision 91.33 % and recall is 83.60 %.

8. CONCLUSION

Feature extraction and feature optimization gives better result instead of all other method used in content based image retrieval. For the extraction and optimization of feature used some existing technique and proposed technique. The proposed technique based on shape based method and some are hybrid method along with another method. Partial feature used ensemble technique for the combination of feature used for the next process. The ensemble features find the even and odd feature combination for the processing. The processed feature is classified by support vector machine, the used support vector machine is linear and function of kernel is feature of invariant. The classified feature produces better result in another feature based technique. The process of feature extraction gives better result instead of another feature extraction technique. But still need some improvement for better result, now used optimization technique for the better selection of feature during image retrieval. For the optimization of feature study various optimization functions such as genetic algorithm, ant colony optimization and particle of swarm optimization.

9. REFERENCES

[1] Yang Hong, Changcheng Huang, Biswajit Nandy and Nabil Seddigh "Iterative-Tuning Support Vector Machine For Network Traffic Classification", IFIP, Pp 458-466, 2015.

[2] Osama Hosam "Colored Texture Classification with Support Vector Machine and Wavelet Multiresolution Analysis", IEEE, Pp 309-313, 2015.

[3] Liqiang Pan, Qi Meng, Wei Pan, Yi Zhao and Huijun Gao "A Feature Segment Based Time Series Classification Algorithm", IEEE, Pp 1333-1338, 2015.

[4] Simone A. Ludwig, Domagoj Jakobovic and Stjepan Picek "Analyzing Gene Expression Data: Fuzzy Decision Tree Algorithm applied to the Classification of Cancer Data", IEEE, Pp 1-8, 2015,

[5] Lakshmi.B.N, Dr.Indumathi.T.S and Dr.Nandini Ravi "A Comparative Study of Classification Algorithms for Risk Prediction in Pregnancy", IEEE, Pp 1-8, 2015.

[6] Umit Lutfu Altintakan and Adnan Yazici "Towards Effective Image Classification Using Class-Specific Codebooks and Distinctive Local Features", IEEE, Pp 323-332, 2015.

[7] Shujin Sun, Ping Zhong, Huaitie Xiao and Runsheng Wang "Active Learning With Gaussian Process Classifier for Hyperspectral Image Classification", IEEE, 2015, Pp 1746-1760.

[8] Lunjun Wan, Ke Tang, Mingzhi Li, Yanfei Zhong and A. K. Qin "Collaborative Active and Semisupervised Learning for Hyperspectral Remote Sensing Image Classification", IEEE, Pp 2384-2396, 2015.

[9] Olga Russakovsky, Yuanqing Lin, Kai Yu and Li Fei-Fei "Object-centric spatial pooling for image classification", Springer, Pp 1-14, 2013.

[10] Zhen Zuo, Gang Wang, Bing Shuai, Lifan Zhao and Qingxiong Yang "Exemplar Based Deep Discriminative and Shareable Feature Learning for Scene Image Classification", arXiv, Pp 1-20, 2015.