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Performance Analysis of Elevation & Building Contours Image using K-Mean Clustering with Mathematical Morphology and SVM

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ABSTRACT

Land covers exemplify the features of land surfaces like vegetation area, soil, mud and crop. In this research, RGB intensity images are used here to detect the Land Use Land Cover (LULC) which is mostly used for sorting of the objects present in the image. This land cover mapping is a chief parameter at local and national level for environmental and land use planning. This research work is focused towards the object recognition on the earth's surface like the changes in the landscapes, which includes the buildings. A novel technique is introduced for increase the classification effectiveness with SVM. The projected techniques consists of four phases of, pre-processing by wavelet transform, segmentation by k-means clustering, training data selection for SVM, classification using trained SVM. Then, k-means clustering is used for segmentation of the image into clusters.

Key Words: Satellite images, K-mean Clusters, Conventional segmentation, Land covers, Digital images, Cluster images.

1. INTRODUCTION

Satellite images played essential role in the life of human, science and all over various field in the end of 20th century and the 21st century. The geographical representations of the earth are given by the images sent by the satellite. All the information found in the images are really important and are used for varied purposes. Specialized remote sensing methods are used for Interpretation and analysis of satellite imagery. Digital images play a fundamental role in lots of image processing applications that include landscape, agriculture, intelligence meteorology, oceanography, cartography, fishing, regional planning, education biodiversity conservation, warfare, forestry, and geology. The image can be interpreted and manipulated in image processing for extracting the image information and producing some other information. The two types of processing the image are Analog and Digital image processing techniques. Printouts and photographs can be taken using Analog or visual techniques of image processing.

The rest of this paper is organized as follows. In Section 2, the Identification of problems formulation related to the existing methods. Section 3 presents detailed description of proposed algorithms for solving the networks issue. Experiment results and discussions are described in Section 4. Finally, the conclusions and further enhanced are given in Section 5.

2. PROBLEM STATEMENT

The techniques can be classified at various levels with images. Sometimes, these conventional systems have lot of restrictions. The major apprehension is the exactness of the Object identification and the visual effects of the obtained images from the sensors of the satellites. The aim of this research work is to remove the noise without losing high frequency details and to highly enhance the image for visual clarity.

The other problems alarmed with the traditional classification techniques are:

To separate the colors, Conventional segmentation and clustering methods are used into the specified homogeneous regions. In the cumbersome process, the conventional method used to extract texture, color and object features individually. The traditional ensemble classifier approaches do not concentrate on all the feature extracted models. So, a latest object recognition system is essential to prevail over the given limits.

3. PROPOSED SYSTEM

Based on the interpretations made on satellite images, the major plan of this research is to propose to an object recognition system that has the facility to establish the land use land cover (LULC).

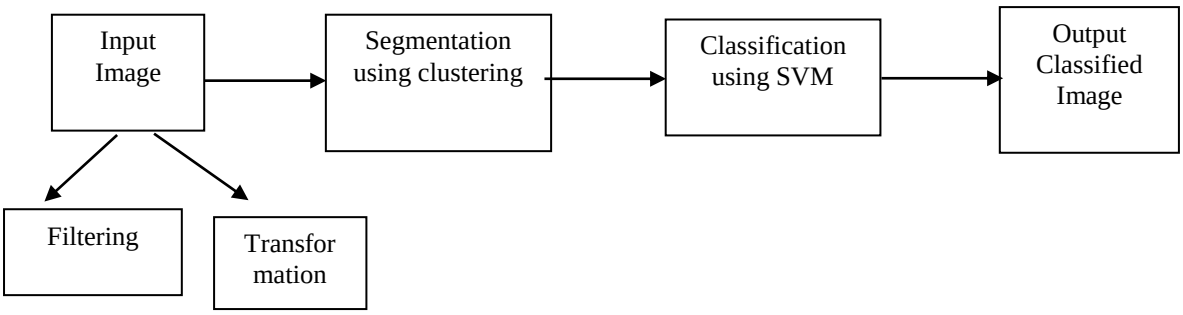

Fig 1. Block diagram of proposed work

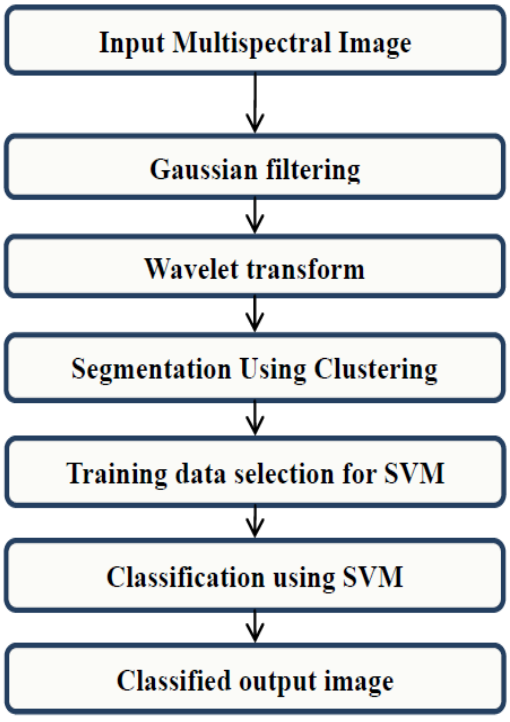

Fig 2. Flow Chart of Proposed work

The objectives of this work are as follows: To propose enhancement and denoising of satellite images, for more effective visual display and to find the Peak Signal to Noise Ratio (PSNR) and Mean Square Error (MSE). To propose segment and cluster the satellite image into six parts, in order to decrease the segmentation error rate. To propose feature extraction, to find the texture Gray level Co-occurrence Matrix (GLCM) features, color features and object features from the clustered patterns. To propose ensemble classification to recognize objects from satellite images, among three different classifiers by comparing the mean accuracy. Initially this number of clusters is taken as starting values. The SVM method was proposed for classification and regression analysis. The nonlinear transform of the kernel function is to transform the low dimensional space to the high dimension space.

4. RESULT AND DISCUSSION

4.1 Satellite Processing Images

Fig 3. Satellite Image Processing

In Figure 3 The Satellite Image processing is by, giving the input image and it got cluster with cluster technique (K-mean clustering) after that, the clustered images are given with mathematical morphology for segmentation with 3 colours as separate image green, blue and red. The output of morphology images i.e the training data are segmented by SVM Classifier and hence gives the detected image as segmented 3 colour images. The satellite image processing is shown.

In Figure 4, the images with separate colour allocation to separate the clustering images as 1,2,3 with green red and blue and the right side workspace window shows the value units for blue neuclei with index value, clustering centre value and cluster idx in units. The segmented colour image is shown. Objects in light blue is to label which pixels belong to blue colour and then display the blue nuclei as separate image. The blue nuclei of gray scale image is converted with K-Mean Clustering and classified with SVM Classifier. The Blue Nuclei image is shown in figure 6.

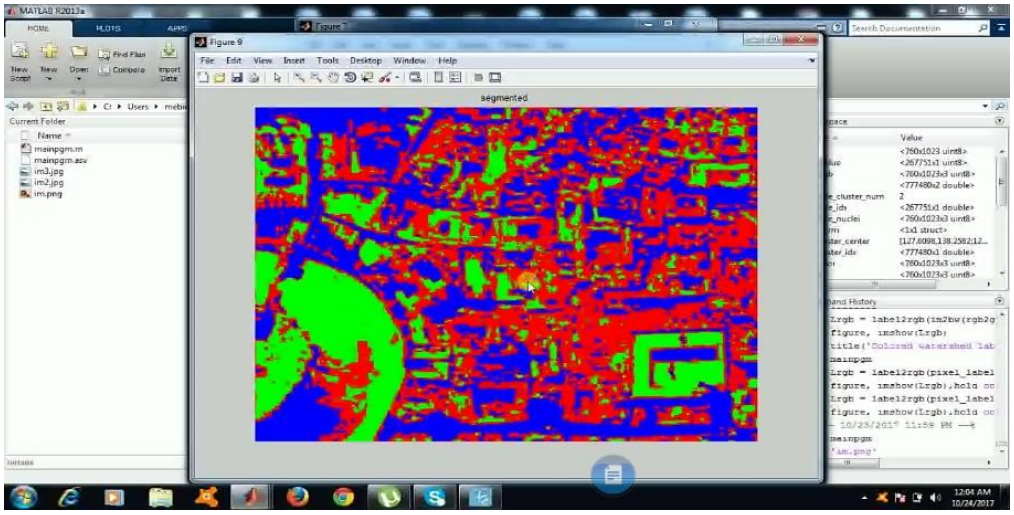

Fig.4 Segmented Colour Image

Fig 5.Clustering Image

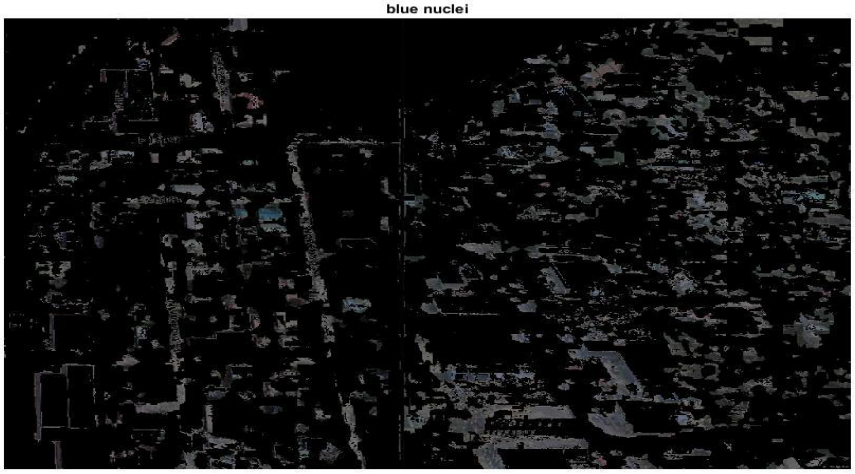

Fig 6. Clustering Image (Blue nuclei)

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5. CONCLUSION AND FUTURE ENHANCEMENT

The research work has aimed at developing a framework for Object Recognition System for Satellite Images using Image Processing and Classification techniques. A set of methods has been used to enhance and denoise the acquired satellite images, segment and cluster the enhanced images; finally to extract features and ensemble classification is done to recognize the object present in the satellite images.

The approach for image enhancement can be extended towards investigating the denoising for any other highly corrupted and blurred satellite images. The segmentation can be done for more than six colors for recognizing the exact objects present in high resolution satellite imagery. It is essential for the researchers to improve the ensemble system for object recognition with high precision.

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