# Fuzzy Rule Based Interpolative used for clustering of diseased affected area of biomedical image

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**Abstract: Using fuzzy rule interpolation (FRI) interpolative reasoning can be effectively performed with a sparse rule base where a given system observation does not match any fuzzy rules. While offering a potentially powerful inference mechanism, in the currentliterature, typical representation of fuzzy rules in FRI assumes that all attributes in the rules are of equal significance in derivingthe consequents. This is a strong assumption in practical applications, thereby, often leading to less accurate interpolated results. To address this challenging problem, this paper employs feature selection (FS) techniques to adjudge the relative significance of individual attributes and therefore, to differentiate the contributions of the rule antecedents and their impact upon FRI. This is feasible because FS provides a readily adaptable mechanism for evaluating and ranking attributes, being capable of selecting more informative features. Without requiring any acquisition of real observations, based on the originally given sparse rule base, the individual scores are computed using a set of training samples thatare artificially created from the rule base through an innovative reverse engineering procedure. The attribute scores are integratedwithin the popular scale and move transformation-based FRI algorithm (while other FRI approaches may be similarly extended following the same idea), forming a novel method for attribute ranking-supported fuzzy interpolative reasoning. The efficacy and robustness of the proposed approach is verified through systematic experimental examinations in comparison with the original FRI technique over a range of benchmark classification problems while utilizing different FS methods**

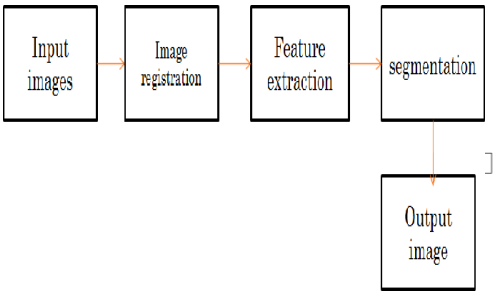
**Keywords: Feature Extraction, graythresh,, spectral graph, STD filter, Range filter, entropy filter.**

## INTRODUCTION

Image classification is a challenging problem in organizing a large image database. In thispaper, Artificial Neural Network (ANN) algorithms have been developed to explore the useful information for the hyper spectral image classification. Satellite images are first handled through a normalization process in order to obtain the equivalent data matrices. Then, two phases are implemented to build the image catalogue; training and classification. The methodology consists of adding a flexible embedding regularizes to the loss function used for training neural networks. Training is done using stochastic gradient descent with additional balancing constraints to avoid falling into local minima. The method constitutes a generalization of both supervised and unsupervised methods, and can handle millions of unlabeled samples. proposed approach gives rise to an operational classifier, as opposed to previously present transductive or Laplacian support vector machines. The proposed methodology constitutes a general framework orbuilding computationally efficient semi-supervised methods. The algorithm was implemented in MATLAB GUI model and was tested on remotely sensed images of different sensors, resolutions and complexity levels.Therefore, the Nowadays, a wide range of Biomedical image Classification method scan be found in the literature :Cluster, Statistic, Bayesian Net, Artificial Neural Networks(ANN),etc.The Neural Network models have been extensivelyused reporting verygoodresults. Neural networks have the properties of parallel processing ability, adaptive capability for multispectral images, good generalization, and not requiring the prior knowledge of the probability distribution of the data, so when compared with statistical classification methods, neural network methods show superiority [12]. In recent years, ANN has become a popular classification method that has non parametric rules. ANN is different from the other classification algorithms. ANN has arbitrary decision boundary capabilities, and it is easy to incorporate different types of data and input structures. ANN yields fuzzy output values that can enhance classification, can generalize better, especially in the use of multiple images, and is tolerant to noise. Of the advantages of ANN techniques, the most important one may be their nonparametric nature. In other words, there is no underlying assumption about the frequency

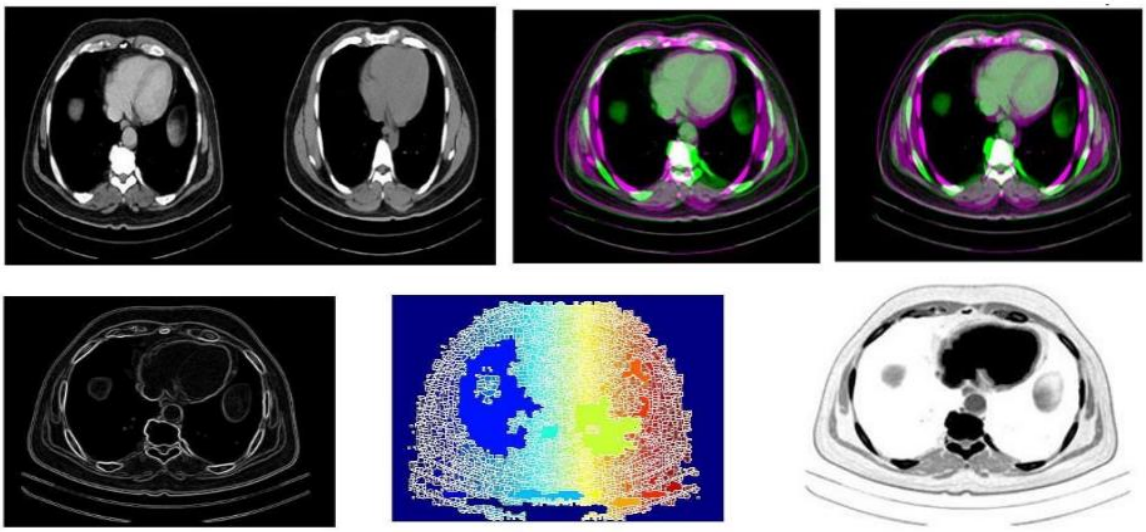
distribution of the data. Although artificial neural network classification methods are more robust than conventional statistical approaches, they have a number of drawbacks, related in particular to the long training time requirement, determining the most efficient network structure for a particular problem, and inconsistent results due to the use of random initial internodes weights. Most importantly, the structure of the network has a direct effect on training time and classification accuracy. There are also problems stemming from the nature of steepest-descent-based learning algorithms

Block diagram of proposed method




In the structure of ANN, the number of processor elements that are in input and output layers is determined by external environment components in hidden layers are usually determined by the method oftrial and error.

The MATLAB GUI model prepared provides users with a powerful toolset for extracting object-specific, geographic features from high resolution an chromatic Data selection



ANN methodology and performance analysis

Features are the characteristics of the object ofinterest.Featureextractionmethodologies analyze objects and images to extract the most prominent features which are representatives of the various and multi-spectral imagery.

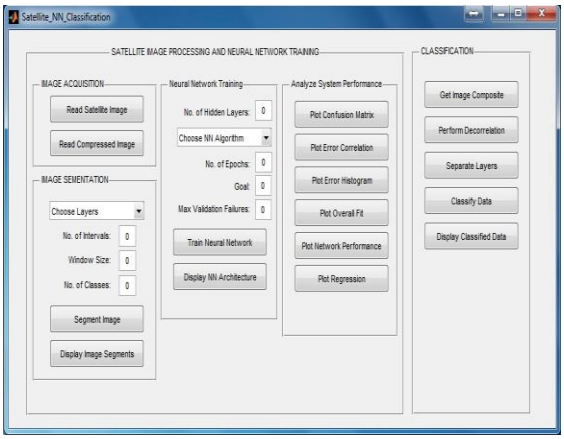
Artificial Intelligence Techniques for Image Classification. Neural Networks methods ANN based techniques were used to identify the patterns in aerial photographs. In those works there were used both supervised and unsupervised ANNs to obtain the patterns. In [13] the GSOM tool was used to classify the Satellite Image with an unsupervised method whereas in the ANN methods where used in combination with fuzzy logic in order to classify the satellite image. Satellite Image and ANNs for the automatic classification where used in the SOM.

There are two main classification of pattern recognition area)Supervised and b)unsupervised form.

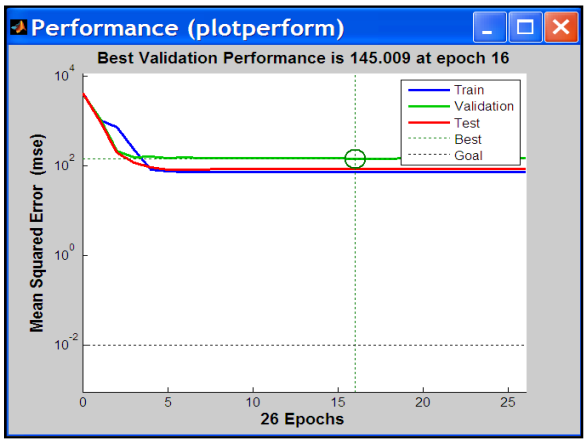
Supervised: The supervised classification provides a data for training the ANN. To get the training data, the process collects several sources of documentation: aerial photography, cartography, and other classification methods. This data must be representative of the study zone.

Unsupervised: This method defines the spectral class in the image where no previous knowledge of the studied area data is necessary. Prior to classification, a, normalization process obtains the pixels from the satellite image, and only the representative pixels are stored. Prior to classification, a normalization process obtains the pixels from the satellite image, and only the representative pixels are stored.

classes of images. Following methodology is used to extract the features of the texture images.
Figure 4 shows the typical display model developed for purpose.




Neural Network Display model Error autocorrelation




## CONCLUSIONS

In the proposed image classification system we have introduced new approach using Haarwavelet decomposition and Back Propagation Neural Network. We used the correlation coefficient, mean and standard Deviation features of the various combination so coefficients produced by the wave let transform. This work may further be extended with feature extraction Using curve let and ridge let transform Image registration is performed on the real time medical liver images by using an affine transformation which is more efficient one compare to all other registration algorithms by doing rotation and translation. So that the registration output is more suitable for next process compare to original input image. After registration is performed, segmentation is done using watershed segmentation method to find out the gradients of image and detect the changes in the defected medical image which is compared with normal medical image.

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