CHAPTER 9

CONCLUSION

This chapter provides a conclusion for the thesis. Initially, an overview of the study is provided and the major findings are summarized. It is followed by suggestions for further research and final comments are made.

9.1 OVERVIEW AND MAJOR FINDINGS OF THIS WORK

The work consists of three phases. In the first phase, neural network and support vector classifiers are dealt with. The advantages of the proposed neural network classifier are

- There is no need for initial identification of number of classes
- Training phase and test phase need not be separated and hence making it an unsupervised method.
- Reduced computational time.

The above mentioned advantages are accomplished with an accuracy of 97%.

The SVM classifier provided the rewards as

- Less complexity in finding the decision boundary.
- Minimum number of training samples
- Accuracy of 90%.
The disadvantage of the SVM classifier is the dependence of the classification accuracy on the training samples.

In the second phase, decision fusion classifier is dealt with to overcome the above disadvantage. The decisions of the individual classifiers are combined in the decision fusion center. The decision fusion center is modeled using Boolean rules and majority voting technique. Two decision fusion classifiers are considered in this work. The first classifier combines the decisions of neural network, Minimum distance to means and Maximum likelihood classifiers. The decision fusion classifier in this case provided an accuracy of 98%. In the second case, the decision fusion center combines the decisions of SVM and Maximum Likelihood Classifiers. The accuracy provided by this method is 92%. The decision fusion classifier in both cases provides better results than individual classifiers.

The third phase includes the use of optimization techniques in the classification process. It modifies the existing techniques like Genetic k-Means Algorithm and Particle swarm optimization. In the clustering methods, the Modified k-Means algorithm converged at a faster rate compared to the k-Means algorithm. The enhanced GKA uses a simplified fitness function compared to the GKA. The complexity involved in the calculation of probability of mutation is also simplified. This in turn reduces the time needed for convergence. For the same number of generations the enhanced GKA and the GKA methods are tested in the classification of remote sensed images. The enhanced GKA proves to be better than GKA. It is found that Enhanced GKA always finds the global optima. Flash GKA is developed by the inspiration of Fast GKA. In Flash GKA a difference based mutation is used. By the replacement of Euclidean distance by difference measure the computation time is decreased. Flash GKA converges to the global optima always. The next technique is customized particle swarm
optimization. PSO is enhanced here as customized PSO to find the globally optimal cluster centers of the entire multispectral image set. The velocity is updated as a factor of the global best value alone. It is found that customized PSO converges to global optima within 100 generations with 98.56% accuracy.

9.2 SUGGESTIONS FOR FURTHER RESEARCH

1) Involvement of more parameters in the classification process may lead to improved accuracy.

2) To improve the accuracy by fusion of proposed algorithms in the thesis.

3) Proper balance between the number of iterations, accuracy and computation time results in a good classification method.