Chapter 9

CONCLUSIONS AND FUTURE WORK

The intelligent partitional clustering algorithms were proposed in this thesis inorder to overcome the issues faced in the partitional clustering algorithms. In chapter 1, the introduction to clustering and partitional clustering algorithms were discussed. The related works and issues in the partitional clustering were studied in chapter 2.

In chapter 3, intelligent statistical clustering methods were proposed and discussed. A novel weighting procedure has been introduced to improve the performance of K-means algorithm. The proposed SD-means algorithm uses standard deviation to discover the number of clusters K automatically. The K-CSD algorithm uses combined standard deviation to partition cluster points in a novel way and also it empirically works well for finding good clusters. It was
also observed that the clustering metric \( i \) is optimized. The K-CSD clustering algorithm and SD-means clustering algorithm outperformed.

In chapter 4, the neural network based approaches WKNN and KNNCSD were proposed and discussed. The number of clusters identified automatically using combined standard deviation as measure in KNNCSD. The efficiency of the proposed algorithms were analysed on six artificial and benchmark data sets. The results showed that the performance of KNNCSD is better.

In chapter 5, the rough set based neural network approaches were proposed and discussed. In this chapter, the KohonneiTs rough neural network was implemented and studied. The Weighted Kohonen’s rough neural network and Kohonen’s rough neural network based on CSD were proposed and implemented. Experimental analysis were performed for handwritten digits recognition based on the 16x16 pixel digit images and 4x4 pixel digit images of hand-written digits. The proposed algorithms effectively recognized the handwritten digits.

Chapter 6 dealt with applications to mammogram image analysis. The 14 statistical features were extracted from mammogram using SGLD matrices. The clustering algorithms studied and proposed in chapters 3, 4 and 5 were applied for
mammogram image segmentation inorder to identify microcalcification. This study showed that the identification of microcalcification by using the proposed clustering algorithm produces the best quality clusters. The study also revealed that the features used in the construction of feature vector has played a vital role in obtaining the high quality clusters.

Chapter 7 dealt with applications of image segmentation. The RGB representation was considered as feature for segmentation. The colour image segmentation was performed by various clustering algorithms studied and proposed in the chapters 3, 4 and 5. It was observed that the proposed algorithms produced the better segmentation with optimum clustering metric value.

Chapter 8 dealt the customer segmentation problem. A new approach was proposed for clustering of categorical data, by representing them as numerical data. Experiment with CoIL data sets showed that it is effective at uncovering similarities in categorical domain.

The proposed algorithms may be applied to cluster the multimedia databases, intelligent databases and distributed databases. It needs further research.