CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 CONCLUSION

The performance of the breast cancer classification system was evaluated using images from the DDSM mammogram database. In this work, a total of 500 (288 benign and 212 malignant) mammogram image were used as a case samples. Preprocessing of mammogram image has been utilized to improve the quality of image, then region growing algorithm has used for segmentation, after the segmentation each mass is represented with 123 features, including 96 texture features, 9 histogram features, 11 shape features, 7 radial distance features. Several feature selection methods were examined for breast cancer classification including the GA, PSO, CS, HS, LOA and the proposed feature selection methods namely Hybrid Harmony Search (HHS), Enhanced Cuckoo Search (ECS) and Improved Lion Optimization Algorithm (ILOA). Feature selection methods have used the Minimum Distance Classifier, k-Nearest Neighbor classifier and SVM classifier for classification.

Results of HHS are compared with Genetic Algorithm (GA), Particle Swarm Optimization (PSO), Cuckoo Search (CS) and Harmony Search (HS). From the results, it has been observed that HHS with k-NN classifier gives high accuracy and selects less number of features for breast cancer classification.
Results of ECS are compared with PSO, CS and HS. From the comparison results, it describes that ECS with SVM classifier produces high classifier accuracy with minimum features.

Results of ILOA are compared with GA, CS, HS and Lion Optimization Algorithm (LOA). ILOA with k-NN classifier for breast cancer classification outperforms well when compared to other algorithms.

Based on performance analysis of proposed feature selection algorithms for breast cancer classification, it is found that the ILOA with k-NN classifier gives high classification accuracy with minimum features. The result obtained from the proposed work confirms that only the informative features leads to improve the classification accuracy.

6.2 FUTURE SCOPE

- The breast cancer classification system can be extended by testing against various databases, various classifier models and different optimization techniques.
- In future work, some other classification measures are also being considered for mammogram image classification.
- Images of same patient can be analyzed using various imaging modalities like Ultrasound and MRI.
- Hybrid classifier techniques may be considered to develop 100% classifier accuracy.
- Three dimensional images may be used to find out the depth of cancer region.
- More number of image samples may be considered with optimal feature sets for efficient breast cancer classification system.