CONCLUSION & SCOPE FOR FUTURE WORK

This research focuses on developing an effective technique for ECG classification. The present research work proposed a framework of three efficient approaches for ECG classification using 20 patient records along with important arrhythmia types.

ECG signals are obtained from MIT/BIH data base. The ECG signals are preprocessed using morphology filter and discrete wavelet transforms variance and third order cumulant based AR modeling has been used for feature selection in all the three approaches.

The first approach uses the SVM classifier for ECG beat classification. SVM identifies the support vectors for non-linear classification, which constructs a maximum margin between multiclass classifications of data. The second approach uses a novel ECG beat classification system using ELM.

The third approach uses the RVM classification technique for ECG classification. This approach provides higher classification accuracies and a lower sensitivity to the curse of dimensionality. The main advantage of the RVM approach can be found in its high sparseness, which is explained by the fact that the adopted optimization criterion is based on minimizing the number of SVs.

The experimental results are carried out for the proposed approaches. The results of the classification techniques with/without preprocessing and DWT-AR modeling are discussed. It is observed from the experimental results that the ECG beat classification using RVM provides better results with preprocessing and DWT-AR modeling.

This capability generally provides them with higher classification accuracies and a lower sensitivity to the curse of dimensionality. The results confirm that the RVM classification system substantially boosts the generalization
capability achievable with the SVM classifier and its robustness against the problem of limited training beat availability, which may characterize pathologies of rare occurrence. Another advantage of the RVM approach can be found in its high sparseness, which is explained by the fact that the adopted optimization criterion is based on minimizing the number of SVs.

The present research develops an efficient framework for ECG beat classification using three classification techniques like SVM, ELM and RVM. These techniques are very much useful for ECG beat classification. In order to improve the performance of the proposed approaches, some enhancements can be done in the present research work. All the drawbacks mentioned in the section 2.4 are removed in this research work.

The future scope of this research is to use effective training techniques. These effective training techniques can be integrated with machine learning techniques like SVM, ELM and RVM to provide significant classification results with better accuracy. Moreover the training time can be reduced with the help of these training techniques.

The second future enhancement of this research would be to integrate the novel unsupervised machine learning approaches with the enhanced artificial neural network techniques for better results.