CHAPTER 8
CONCLUSION & FUTURE SCOPE

8.1 Conclusion

Electrocardiogram (ECG), an important and popular technique used as an important diagnostic tool for detecting cardiovascular diseases. ECG Signals provides essential information about heart disorders that may arise. The main objective of this proposed method is to develop a fast and reliable real time system for early diagnosis of cardiac arrhythmias. For analyzing cardiac patients, it is necessary to recognize specific arrhythmia in order to provide accurate and timely treatment. An arrhythmia refers to the observation of abnormal heart beats. When any type of this abnormality found in the upper portion of heart i.e. atria is termed as Supraventricular arrhythmias and when it occurs in lower portion of heart i.e. ventricles is characterized as Ventricular arrhythmias. This thesis shows the feature extraction and classification of various arrhythmias including ventricular arrhythmias and supraventricular arrhythmias. Authors shows the differentiation between ventricular arrhythmias and supraventricular arrhythmias. The methods adopted for classifying various arrhythmic and normal signals are discrete wavelet transformation, cross recurrence quantification and probabilistic neural network. Wavelet transformation is used for extracting the features of experimental signals, the quantification approach is used to calculate different RQA measures like recurrent rate, laminarity, entropy, determinism, trapping time and transitivity. The values obtained on the basis of these RQA measures are used for training and testing the neural network classifier. The performance evaluation has been done on the basis of sensitivity, selectivity, specificity and accuracy. The overall accuracy achieved by using this method gives 100% accuracy. Authors produces results by using various arrhythmic signals based on proposed methods Chapter 4 depicts the results after classifying ventricular arrhythmias, chapter 5 presents the results of supraventricular arrhythmias and chapter 6 shows differentiation between both (ventricular & supraventricular) arrhythmias. Authors presented the comparison of our work with other arrhythmic detection attempts in above chapters. Based on the results obtained it can be realized that the proposed unified approach of DWT, CRQA and PNN in this work is enough capable for classifying arrhythmic signals and provides an independent approach that will helps the health care professionals in easy diagnosis of arrhythmic patients. The aim behind this work is to develop a reliable system for the analysis and classification of arrhythmic patients. This automated approach will help in reducing the sudden cardiac death rate due to the delay in diagnosis.
8.2 Future Scope

Further this approach can be extended for developing a unified model for the diagnosis of numerous heart related diseases. The proposed work in this thesis can be implemented in future as an economically better alternative diagnostic tool for health care professionals.

8.3 Goals Achieved

Goals have been achieved while carrying out this work are:

- Detailed study of cardiac arrhythmias
- Feature extraction and classification of supraventricular arrhythmias
- Feature extraction and classification of ventricular arrhythmias
- Differentiation between ventricular and supraventricular arrhythmias
- Comparison of our method with others
- Real time implementation of our proposed system

8.4 Contribution of the thesis

The output of this thesis may helpful in:

- It will be useful in identifying cardiac arrhythmias.
- It will be beneficial in the treatment of arrhythmic disorders.
- It will be helpful in differentiating between normal and abnormal (arrhythmic) patients.
- Particular arrhythmias can be identified in early stages of diagnosis, hence reducing sudden cardiac deaths
- This work can explore some more aspects of diversified fields like biomedical signal processing, neural network, biomedical engineering and many more.