CHAPTER 9

CONCLUSION

9.1 CONCLUSION

In this research work the detailed study was undertaken about Computer Aided Diagnosis tool to design a perfect, flawless and fully automatic technique for screening the mammogram. This thesis explains the whole research work in developing such an automatic malignancy diagnosis system. This research work went through developing three different techniques. The first two were developed by integrating the existing current algorithms in image processing to get the reliable result. The final approach is designed to overcome the pitfalls of the previous approaches, implementing an innovative algorithm “Gray Level Gradient Buffering” which is specifically designed for mammogram segmentation which in turn increases the reliability and accuracy of the output by 99.1%. which is the highest accuracy percentage of existing malignancy diagnosis systems.

The only way to reduce the mortality rate due to breast cancer is early diagnosis and treatment. Mammography is the only available method which can diagnosis the cancer cells in early stages. At present mammogram screening is made manually by the radiologists, they examine the mammogram visually for the presence of abnormalities which can be interpreted as cancer. But due to variety of factors the efficiency of reading varies from 65% to 85%, this leads to misdiagnosis. Hence to get the reliable and accurate result second reading is essential. Many Computer Aided Diagnosis techniques have been developed to perform second reading for the past two decades. Even then the detection rate is still not high
enough and globally accepted CAD system which can produce invariable result for all kind of mammograms is not available.

The designed CAD system MDTR has 99.3% Sensitivity and 98.1% Specificity. The accuracy of the diagnosis system is found to be 99.1%, which is comparatively greater than the existing methods. “Gray Level Gradient Buffering” algorithm has been innovatively designed especially for segmenting the mammogram image. This gives excellent segmentation result which in turn increases the efficiency of the diagnosis to the greater level. One more important thing about CAD is it should produce constant result invariantly for all kind of mammograms irrespective of quality, this cannot be guaranteed in all the CAD systems. MDTR can assure the same result for any kind of mammograms.

Final approach MDTR has been demonstrated in front of the radiologists, their opinion has been submitted with this thesis. One of the most advantages about this technique is its user friendliness. Just by simply providing the mammogram image as input, we can get the output as message immediately. The radiologists can work with the system without any coding knowledge. It is completely automatic system which does not need any human interruption. Hence without doubt it can act as a perfect second reader in assisting the radiologists to diagnosis the cancer cells in mammogram more efficiently and effectively. Hence the proposed technique can be helpful to the human Society in such a way that it can give the assurance for the efficient diagnosis of early cancer cells so that the female mortality rate due to breast cancer can be reduced to the maximum level.
“This technique saves women in early stage if they are prone to breast cancer; hence this saves a woman, in turn a family, in turn a society”

- Thanks to the almighty for provoking this research topic in my mind and leading through out to complete this research to serve the society better.

### 6.2 FUTURE DIRECTION

The proposed Computer Aided Malignancy diagnosis system, MDTR is tested mainly with MIAS and DDSM databases, Even though the MDTR achieves the 99.1% accuracy with research database implementation, the result may vary in real time mammograms due to physical and environmental constraints. Hence the Computer Aided Malignancy diagnosis system can be enhanced by implementing more real time mammograms and the accuracy can be enhanced to 100% by enhancing the proposed Gray Level Gradient Buffering algorithm and extracting three dimensional features of mammogram.