CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 OVERVIEW

This chapter provides the contribution to knowledge evinced in this research. The goals, achievement and significance of this research in correspondence to the obtained results, and the important findings are highlighted. This chapter discusses the significance of the framework developed for the radiologists and the clinical labs for cancer cell detection. The system developed will certainly assist the radiologists and surgeons in diagnosing the cancer.

The main contributions made in this thesis are as follows:

- In Chapter 3, automatic detection of cervical cancer in PAP smear images using Multi Model Texture Features and Fuzzy based SVM is developed.
- Two major contributions of this research are feature extraction and classification.
- In feature extraction, the texture feature had been extracted from every segment for better classification.
- In classification, Fuzzy logic based support vector machine classifier is used for improving the classification process.
• It classifies the PAP smear images normal and abnormal. The overall classification accuracy of our proposed (MMTF with K-SVM) method is 94%.
• In Chapter 4, a novel cervical cancer classification system is developed, which includes feature extraction, and classification of normal and abnormal classes.
• These cancer classes may have similar characteristics in their intensity and texture pattern.
• However, these cancer classes differ in their location, size, and shape.
• The proposed method is developed by multi model-texture features and machine learning algorithms.
• In feature extraction, texture features extraction process is increased using both co-occurrence matrix and histogram for better classification of cervical cancer PAP smear images.
• The performance of the proposed algorithm is tested and compared to other algorithms on public image database.
• The overall classification accuracy of the proposed CSID+HKSVM is 94 %, but the existing methods CSID +SVM, CSID +RBF and CSID +FFNN produce 90 %, 84% and 72 % respectively.
• In Chapter 5, a cervical cancer classification system is developed, which includes feature extraction, and multiclass classification of four classes of cervical cancer types such as Mild dysplasia, Moderate dysplasia, severe dysplasia and Carcinoma in situ.
• These cancer classes may have similar characteristics in their intensity and texture pattern; however, these cancer classes differ in their location, size, and shape.
• The proposed method is developed by multi model-texture features and RBF kernel based support vector machine.

• The overall classification accuracy of the proposed method is 96.8%, but the existing methods RBF and SVM produce 91.32% and 94.32% respectively.

The primary objective of this work is to find an innovative way to increase the classification accuracy of cervical cancer in PAP smear images. The efficiency of the proposed system has been demonstrated and evaluated through simulations with the existing systems.

Computerized diagnosis is extremely beneficial to clinics with desire to have expert radiologist. The following outlines some of the numerous benefits of the developed systems.

1. Detection of the cervical cancer and subsequent screening and interpretation will greatly assist radiologist arriving at very informed diagnosis.

2. Wrong identification of cervical cancer areas is devoid because the systems put checks to reduce the cases of false positives.

3. The patient waiting time is also greatly reduced as the diagnosing time is only in some few seconds.

The overall responsibility of locating and detecting cancer is the burden of the radiologist. In the situation where the radiologist cannot locate the cancer with ease, they take into consideration, the output of the developed system, to form an opinion as it is hard to know the defined boundary of the cancer cell.
6.2 FUTURE SCOPE

Precedent upon the current investigations and contributions carried out for automatic classification of cervical cancer in PAP smear images, there following are some suggestions for future work.

(i) The algorithm developed should be incorporated into prototyped software to be used by physicians.

(ii) Ultimately, the prime objective is to detect, segment, and to identify various types of pathological tissue that occurs in the field of paediatrics.