CHAPTER 7

CONCLUSION AND FUTURE SCOPE

This chapter reports the main conclusions of the work done in the present thesis and its future scope.
The work reported in this thesis investigates different aspects of fractals and iterated function systems. To enrich the theory of fractals, Hutchinson Barnsley theory is studied in $G$-metric space, $G_b$-metric space, fuzzy metric space and intuitionistic fuzzy metric space with some general contraction maps. The applicational aspects of fractals are also investigated for classification, encryption and compression of some images.

7.1 CONCLUSIONS

The main conclusions are as follows:

(i) The Hutchinson Barnsley theory in the setting of G-metric space is studied and the results concerning iterated function systems are generalized.

(ii) The theory of iterated function system is studied and extended in fuzzy and intuitionistic fuzzy metric spaces and various existence and uniqueness results regarding fractal attractors are established. The obtained results generalize the results of Mihet (2004), Suzuki (2004), Alaca (2006) and Uthayakumar and Easwarmoorthy (2012).

(iii) A combined encryption compression scheme using chaotic maps (CECSCM) is proposed. The results are found to be better than that of Mannicccum and Bourbakis (2001), Kumar and Makur (2008) for selected images.

(iv) Combined encryption and compression schemes using Julia sets (CECSJS) and Iterated function systems (ECIFS) are proposed. The obtained results are better than that of Mannicccum and Bourbakis (2001), Kumar and Makur (2008) and JPEG 2000.

(v) A method of classification of images is proposed using improved generalized fractal dimension (GFD) method. The results verify that the improved GFD provides classification with 99% accuracy, which is statistically verified by Kruskal-Wallí's test.
7.2 FUTURE SCOPE

The work reported in this thesis may be extended as follows.

(i) The existence and uniqueness of Hutchinson Barnsley operators may be investigated for the maps satisfying some more general contractive conditions in new settings.

(ii) The theory of iterated function systems may be explored for applications in approximation through fractal interpolation functions.

(iii) The applications of fractal dimension, particularly the generalized fractal dimension may be investigated in the areas of bio-medical sciences.

(iv) The combined encryption compression algorithm can be made more efficient by improving its time complexity.