Chapter 9

Conclusions and Future Outlook

In this chapter a short summary of this thesis as well as future scope within uncertainty analysis in terms of fuzzy set theory and imprecise probability is given. An overall conclusions and recommendations for future research in this thesis are as follows:

1. Quartiles of GFN with different left height and right height are formulated. Also the locations of these 1st, 2nd and 3rd quartiles and its membership grade could be found from the formulation. These quartiles evaluated on GFN with different left height and right height is just not restricted to fuzzy number defined there, but these results are valid for fuzzy numbers such as triangular, trapezoidal and other types of GFNs. Statistical properties such as quartile coefficient of skewness and quartile coefficient of dispersion are also could be evaluated from the derived quartiles which will be an extension of this work.

2. A methodology of uncertainty modelling under the presence of fuzzy and imprecise probability has been developed.

3. The SRSM is accomplished through aleatory and epistemic uncertainties to draw the uncertainty in a framework. The aleatory uncertainties are probabilistic and epistemic uncertainties are fuzzy. Generally Hybrid methodology requires a lot of simulations for the exact realizations of the results, but this method of uncertainty quantification requires a less numbers of model simulations.

4. Further, the SRSM is accomplished for the construction of probability bounds, and this method of uncertainty quantification also requires a less number of simulation for the realizations of the results then the ordinary method of probability bounds calculations.
5. A non-probabilistic sensitivity analysis of atmospheric dispersion model RIMPUFF has been demonstrated. The Hartley-like measure has made it possible for determining the sensitivity of the parameters. However, this method has limitations since it fails to determine the interaction between the parameters. Hence a methodology under fuzzy domain to determine the interactions between the parameters is a challenge for the future research, in fact, a global method of sensitivity analysis under fuzzy domain has to be thought of.

6. Again a non-probabilistic sensitivity and uncertainty analysis of atmospheric dispersion model has been demonstrated through Gaussian plume model. Sensitivity analysis has been performed by the Hartley-like measure and uncertainty analysis due to the most sensitive parameter has been performed by the Fuzziness measure.