Conclusion

Since the publication of the classical paper on fuzzy sets by L. A. Zadeh in 1965, the theory of fuzzy mathematics has gained more and more recognition from many researchers in a wide range of scientific fields. Among various branches of pure and applied mathematics, convexity was one of the areas where the notion of fuzzy set was applied. Many researchers have been involved in extending the notion of abstract convexity to the broader framework of fuzzy setting. As a result, a number of concepts have been formulated and explored. However, many concepts are yet to be fuzzified. The main objective of this thesis was to extend some basic concepts and results in convexity theory to the fuzzy setting.

The concept like matroids, independent structures, classical convex invariants like Helly number, Caratheodory number, Radon number and Exchange number form an important area of study in crisp convexity theory. In this thesis, we try to generalize some of these concepts to the fuzzy setting.

Further extending the concepts in crisp convexity theory, we have introduced fuzzy JHC space, CUP etc as the properties of a fuzzy convexity space. We have proved many results in this direction. Further, we have extended and explored the notion of various types of dependence as a background for doing further work in the theory of classical convex invariants to the fuzzy context. Also we have obtained one result (Prop 3.2.3) whose importance according to us is in lifting results from the finite to the general case. Another important result that
we have proved is that fuzzy matroids form fuzzy independent structures as in the crisp case but the converse need not be true. Finally, we have defined different types of fuzzy matroids derived from vector spaces and discussed some of their properties.

Still there are results in crisp theory related to the topics covered in this thesis which are to be investigated in the fuzzy setting. There are lots of ideas still left in convexity, for which fuzzy analogues are not defined and explored.