CHAPTER 10

CONCLUSION AND FUTURE ENHANCEMENT

10.1 CONCLUSION

Image Retrieval is one of the widely explored research areas. To design an effective image retrieval system with high accuracy, we need to train our system syntactically and semantically. By analyzing the Anteraceae flower family, the Asteroideae family was classified with respect to their physical characteristics. Thus these classification details provide the key knowledge for the creation of domain specific AFIF ontology.

The combination of textual and visual feature information in an ontology is said to be Multi-Modal Ontology, by creating such ontology the semantic gap is reduced. For the Asteroideae family flower domain, a multi-modal ontology (AFIF) has been created with respect to its domain knowledge and visual feature. The syntactic visual features used in this ontology creation were the prevalent color, basic intrinsic pattern and the contour gradient of the given images. These feature vector values are dimensionality reduced and embedded into the ontology.

After creating the ontology, it was evaluated by ontology reasoning technique. For this, a set of query axioms was created and the instance of coverage was determined to find the accuracy of the ontology. The overall retrieval recall rate with respect to flower image dataset is around 83% without any semantic information on it. The retrieval rate with semantic
information is around 92%. The created ontology can be used as a backend process for any kind of retrieval process. As the created ontology is in OWL language, this system can be easily incorporated in Semantic Web-based image retrieval systems.

10.2 FUTURE ENHANCEMENT

The work reported by this thesis has focused on a particular flower family based image dataset. The probable as well as possible enhancements that can be done with terms of ontology are:

- A generic ontology which suits all flower images can be created if we have the exact horticulture information regarding all species in this world

- In this work, to reduce the computation time on image retrieval, the dimensionality of the BIP and CGR feature vector was reduced. Instead of reducing the identified feature vector, a fuzzy membership function can be devised to select an appropriate feature with respect to given input image. Thus, fuzzy system can be included into the ontology.

- Instead of relying on one ontology with all information, one can create two ontologies one for image feature vector and the other one for particular domain knowledge. Thus, these two ontologies can be integrated during retrieval process. By doing so, more information and resources regarding the image can be created and ontology can be provided for different domains.

- The BIP and the CGR feature vector algorithms can be modified with respect to medical images and one can create an ontology for medical image with relevance feedback component.