CHAPTER 6

CONCLUSIONS AND SCOPE FOR FURTHER STUDY

6.1 Conclusions

The enrichment made in the image processing technology ascends the digital image forgery detection as an interest research topic in the forensic science. This research aims to move towards the broader goal of deciding whether any given image is forged or not based on the inconsistencies related to the shadow and reflection. The vanishing point computation method is used to detect the shadow based image manipulation. In this method, if the shadow vanishing point and light vanishing point meets in a single point, then the image is an original image. To detect the reflection based image manipulation, geometrical representation technique is used. In this method, the distance between the object to the mirror and the mirror to the object should be the same for the original image. For the parallel forgery detection, the fuzzy set based segmentation method is addressed.

In the vanishing point method, a geometrical representation technique is developed to identify the shadow points in the image. Also, collective segmentation technique is applied to extract the shadow part from the image. The detection is performed by comparing the extracted shadow point from collective segmentation with the discovered shadow point from geometrical representation technique. The deviation in the distance of the shadow point shows the presence of the tampering. A geometrical representation technique is developed in the proposed method for discovering the reflection points in the image. Moreover, a collective segmentation technique is utilized to extract the reflection part from the image. The forgery detection is achieved by comparing the extracted reflection point from the collective segmentation with reflection point discovered using the geometric representation technique.

The parallelized method is used to detect the shadow and reflection inconsistency forgery in image. In the proposed framework, candidate based segmentation is used for shadow point extraction and fuzzy set based segmentation is used for reflection point extraction. Moreover, light consistency and strength of light features extracted from the reflective and shadow parts is utilized to train the neural network classifier for the forgery detection. In the neural network classifier, a new training algorithm is developed by integrating the LM algorithm and ABC algorithm for updating the weight in the learning process. On experimentation, the proposed method resulted in forgery detection with detection accuracy of 80.49%. To ensure more efficiency, some random noise is added to the tested image and detection accuracy is measured which also ensure in promising results.

6.2 Scope of Further Study

The present study analyses passive shadow and reflection forgery detection techniques to overcome noise in different tampering region. The image authentication is inaccurate due to poor lighting. Due to these limitations 100% accuracy in image authenticity cannot be determined. As future work, improvements can be included in the digital image forgery detection based on shadow and reflection inconsistencies by combining different decision approaches to improve the image authenticity and integrity.

It is suggested that for future study the optimal feature set for forgery detection exploited in the feature extraction technique can be undertaken. Noise variance detection can be enhanced with respect to the size of the tampering region. Ability to deal with the problems in the rotating and scaling images is another aspect for further research. In addition some techniques like source camera identification, training dataset reduction, evaluation methodology for optimal parameter determination etc. can be integrated that may improve the accuracy and the computation time.