CHAPTER V

CONCLUSIONS AND FUTURE WORK

5.1 Conclusion

The main problem of depth's ordering from single monocular image is the third-dimension lossy information. We try to recovery the third-dimension from a two-dimension single image by using the neural network to order all of areas in an image by logical depth. The experimental results performed on the test data in Chapter 4 show that the logical depth orders can be mostly discriminated.

From analyzing the validation results of 5 image groups, the average efficiency in foreground area classification is 10.74%, middleground area is 17.52%, and background area is 4.1%. From Table 4.2, the minimum error in classifying foreground area is 8.77% in the validation image group 2, 12.33% for middleground area in group 5 and 5.75% for background area in 3 image groups which are 2,4 and 5. These three validation image groups have the standard deviation values 10.24, 15.67, and 8.31, respectively. The group which gives the lowest standard deviation value, group 5, is selected because it represents the more uniform of data in the considered group.

The derived information from Table 4.5, 4.6, and 4.7 shows the number of validation image that give the percentage error less than 5% and greater than 5% of area classification in foreground, middlegroun, and background. From investigation over these error, we found that the average of wavelet coefficients in in-focus and out-of-focus areas are affected by them. If the average value less than 1 it will relate to the greater than 5% error. On the other hand, if the value equal or greater than 1 the percentage error will be around 5%. This ratio of the two regions can be used for considering the training set in neural network learning process. From the experiment, it obvious that the wavelet coefficients distribution ratio between in-focus and out-of-focus area less than 1 give the greater than 5% of error in all three areas. The image from the Standford University test set was applied by our propsed method and we obtained the percentage error in forground is 10.06%, middleground is 12.43% and 5.75%. The main reason that the error of three areas greater than 5 % is hard to identify between the in-focus and blur areas.

The type of test image is the limitation in our work, we will obtain the good performance of region extracted by considerin the ratio that equal or greater than 1 of wavelet coefficients between the in-focus and out-of-focus regions. From the comparison result of our method with the Standford University test image, the ratio of the in-focus and out-of-focus regions less than 1 is made the greater than 5% of error.

5.2 Future Work

The area's image depth's ordering problem can be extended to cover further studies.

1. To reduce the false rate by adjusting the number of block in an image more than 20-by-20 blocks, the result images will have more resolution than current used block size.
2. Increasing the number of depth's orders. In this dissertation, we limited the number of the order to three layers. To increase the number of depth's orders, the number of neural networks and the depth's level areas in training images must be increased and prepared before training process.