

Chapter 6

Conclusions and Future Works

6.1 Conclusions

The dynamic range defined in chapter 2 in real world is much wider than DSCs. Image fusion with different exposures avoids information loss in the highlight region and under the shadow. However, it is impossible for us to take pictures continuously without hand-shake. Image registration becomes an essential technique before image fusion applications. Our experimental results in chapter 5 show that the global motion vector of previous image registration algorithms is unsuitable especially when the scene includes near objects and far background. Above issue is improved by our proposed algorithm which is the procedure of local motion vector. Moreover, the complexity of our proposed registration is lower than Ward's algorithm.

For the image fusion application of HDR, the previous method has been proven that combining two exposed images with each weighting function is workable. However, there are some issues including camera response curve, weighting function, and combination exist such as discontinuous boundary. Our proposed fusion algorithm can produce a smooth region in bright region. In addition, the performance of our results integrating proposed registration and fusion algorithms is preferable.

6.2 Future Works

The proposed image registration algorithm has good potential for various applications. Besides, fusing more than two images is applicable. One of the applications is the noise reduction. Generally speaking, the effect of the image noise is random. Thus repeated noise which is produced at the same position of the sequential images is impossible. Therefore, noise can be suppressed by filtering these sequential images at the same position. Image registration is required to register the correct position of each image. The concept is shown in **Fig. 6-1**. Three images are taken continuously and registered each other. After filtering, the noise of the image will be reduced.



Fig. 6-1 (a) Three images with the same scene but with more noise. (b) High quality image with fewer noise after filtering (a).