Chapter 6

Conclusion and Future Work

6.1 Conclusion

CBU appears depended on the viewing conditions. This particularly implies that current field-sequential technology does not function at a sufficient refresh rate to fully eliminate the perception of the visual artifact. Yet, how fast is enough for current designing FSC LCD? In the visual model, we proposed a visual model to define CBUA as the index to quantify CBU. By performing psychophysical experiment, the threshold indistinguishable CBUA was found as 0.22° . From the established model, most of the important engineering parameters of an FSC-LCD can be derived. For example, 86 Hz should be a minimum frame rate for a 32” FSC-LCD to eliminate CBU. Therefore, a very simple apparatus can be used to evaluate CBU for different FSC-LCD panel, and the model can be utilized for designing a FSC-LCD to suppress CBU. Furthermore, the indistinguishable viewing distance can be used as the criterion by using suppression algorithm to eliminate CBU in FSC displays. Most importantly, some of the important engineering parameters such as test pattern width, eye moving velocity, and viewing distance of an FSC LCD can be deduced from the model when CBU suppression is concerned. Therefore, this proposed model for eliminating CBU is quite useful for current designing FSC LCDs.

6.2 Future Work

Field sequential color technology has been adopted by numerous displays for its large size, thinner and high image quality. In order to minimize the appearance of the color breakup artifacts, the viewing conditions such as the responses of the human eye or the sensation of the human psychophysical evaluation should be considered in FSC displays. One way passable to suppress CBU is to decrease the visibility in human perceptual processing.

CBU could be highly suppressed once the environment conditions were known in our model. However, this research target is focus on the static image under eye moving view for rudimentary CBU study. Actually, we often move our eye ball when we see the movies or TV programs in our everyday life. In further research, we may induce eye tracking view to study the influence of CBU. First, the mechanism of smooth pursuit movement should be studied by eye tracker to quantify the mechanism of human perceptual processing such as eye movement amplitude, duration, and velocity. For measuring CBU, the image with CBU will be recorded by using high speed camera and rotational motorized stage such as the measurement device of motion blur to simulate the movement of eye tracking. Therefore, the ultimate goal is to develop a more general model to provide a design rule to greatly improve the visual quality in all kinds of FSC displays.

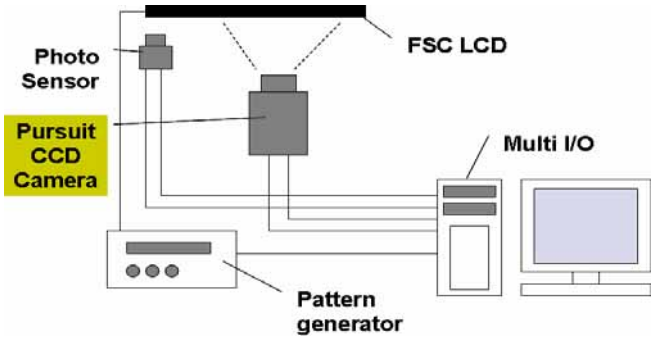

Fig. 6-1. Experiment apparatus for measuring CBU on moving image by using CCD camera and rotational motorized stage.