

CHAPTER VI

Conclusion and Future Work

6.1 Conclusion

This dissertation presents a novel multi-view face and facial detection algorithms [61, 62, 66] that are applicable to any image types under various conditions and rotations with any appearances. The algorithms can be applied to any face images with high detection rate and low false positive rate. The algorithms separate into two main steps. The first step is face detection. The existing face detection methods require intensity and color information. However, there are some errors of face positions when input images are distorted or occluded by some objects. To overcome such shortfalls, the intensity and color information should be avoided. Mean face templates obtained from a large collections of face in various views, rotated angles, and sizes (from 21×21 to 393×393 pixels), are used to scan all around edge image to find face-like region. The second step is facial feature detection and is applied to detected faces. Facial features are coarsely extracted from neural visual model. Some irrelevant regions from NVM are eliminated by applying mathematical morphology called dilation. Furthermore, the proposed algorithms are extended to cover rotational invariance problem by using Radon transform to extract the main face angle. Detection results on several databases have been performed in all classes of face images with detection rate more than 94% while the detection rate of other existing techniques is about 90%.

6.2 Future Work

There are some solutions which can make this research more effective as follows:

- Reducing processing time. Some circumstances affect the processing time such as image representation, order of processing, and Matlab tool. The algorithms will be speeded up if integral image [55], a new image representation, and parallel processing are applied on C++ instead.
- Increasing detection rate. A failure case that can be improved is the detection of face without face boundary as shown in Figure 5.17(b). Since face width is obtained from the boundary of face, the face without boundary cannot be extracted using the proposed method. To overcome this shortcoming, other face characteristics should be used instead.



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