CHAPTER 5 EXPERIMENT RESULTS

In order to test the effectiveness of our proposed method, we used a two-hour MPEG-7 sequence to generate our video database. The database contained more than five hundred video shots of different programs, including news, sports, documentaries, and home videos. Since the test video had been represented by several key frames and a color feature vector had been extracted from these key frames, the test video was in fact represented by a sequence of feature vectors. To retrieve similar videos from the database, a query can be formed by an image or a video clip. The system extracted the sequence of feature vectors from the query and compared the subsequence of feature vectors in the feature database by sliding method. Therefore, the response time of this querying process was within one second (given more than five hundred shots in the database). **Figure 10~Figure 12** illustrate three sets of experiment results, all derived by the query-by-example strategy. In **Figure 10** we queried the database by a video clip with a view of grasslands and the four most similar candidates were retrieved and listed from top to bottom according to the degree of similarity. **Figure 10(a)** shows the key frames of the query video. In **Figure 10(b)**, the frame number was shown below the key frame.

The second line represents rank order and video id. Because our approach for video retrieval was based on color information, the retrieved video clips were very close (in the sense of color) to the color content of the query video (**Figure 10(b)**). **Figure 11** shows another example, and the query video which was randomly extracted from the test video was a video clip that contained a balloon flying in the sky. The four most similar candidates are retrieved and shown in **Figure 11(b).** In **Figure 12**, we use another query video clip that was extracted from the news program in the test videos to query the video database. Our system also retrieved the four most similar candidates from the database and outcome is shown in **Figure 12(b)**.

Since the test video had been represented by a sequence of feature vectors and the query video also had been represented by the query sequence, computing the similarity between the query and the database videos could be transformed into the problem of computing the similarity between the sequences of feature vectors. Therefore, the response time of our video retrieval system was very short. Moreover, it is clear that our system can retrieve several candidates whose visual content are very similar to the query from the video database.

In order to test the accuracy of our retrieval system, we randomly extracted about twenty query video clips from the video database and then calculated the ratio of *precision* and *recall*. *Precision*= $\frac{D}{D+FD}$, where D: retrieved data and FD: fault data. *Recall*= $\frac{D}{D+MD}$, where *D*: retrieved data and *MD*: missed data. The Precision/Recall curve is shown in **Figure 13.**

(a) Key frames of a query video

95 347 402
Rank:1 VideoID=2

2444 2557 2602
Rank:2 VideoID=2

813 1098 1229
Rank:3 VideoID=2

1498 1597 1889
Rank:4 VideoID=2

(b) Key frames of the retrieved database videos

Figure 10

(a) Key frames of a query video

20480 21093
Rank:1 VideoID=3

16437 17335
Rank:2 VideoID=3

13169 14555
Rank:3 VideoID=3

19150 19631
Rank:4 VideoID=3

(b) Key frames of the retrieved database videos

Figure 11

(a) Key frames of a query video

9818
Rank:1 VideoID=3


9996

15096
Rank:2 VideoID=3

15153

7968
Rank:3 VideoID=3


8220

5497
Rank:2 VideoID=3

5888

(b) Key frames of the retrieved database videos

Figure 12

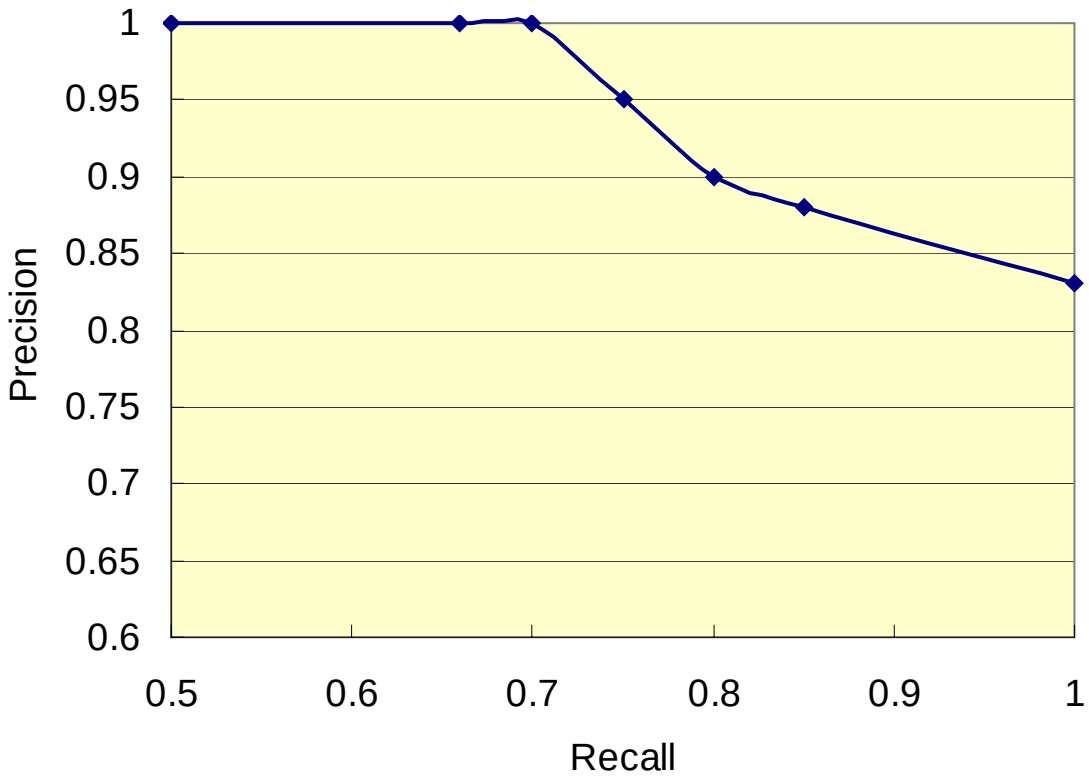

Figure 13