some oversegmentation.

These experimental results prove that the proposed method outperforms the other two methods in terms of visual evaluation. It not only produces a good segmentation boundary, but also avoids oversegmentation.

4.2 Semantic feature extraction

In this experiment, semantic features are extracted from spectral and textural features. To determine the optimal number of semantic features, different numbers of semantic features are used to retrieve images. Without considering time requirements, the retrieval precisions obtained for the initial 20 (40) result images (denoted as Top (20(40))) are shown in Fig. 6.

![Fig. 6. Retrieval precision for different numbers of semantic features.](image)

The result indicates the general trend that the larger the number of semantic features, the higher the retrieval precision is. This occurs because more semantic features are used to describe the image content, more details can be described. However, a larger number of semantic features will lead to greater computational