

PERFORMANCE COMPARISON AND ENHANCEMENT OF CONTENT-BASED IMAGE RETRIEVAL

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Content-based image retrieval (CBIR) is becoming more and more important with the advance of multimedia and imaging technology. Among many retrieval features associated with CBIR, colour, texture and shape are some of the widely used features. The objective of this research is to evaluate different feature descriptors proposed for CBIR and to develop enhanced feature descriptors to optimize the retrieval performance.

Different descriptors have been developed based on colour, texture and shape features. As the first step such features and their performances are analyzed. Secondly performances of individual descriptors are compared to determine which of them are more effective in retrieving images. Finally we investigated combined feature descriptors in order to enhance the retrieval performance.

Each individual feature is tested with publicly available image databases. Based on their performance three enhanced feature descriptors are designed and proposed. In first case, a combination of color and texture feature descriptors are used to propose a novel method by considering the advantages of both colour and texture properties of images. The 2D-Discrete Wavelet Transform (2D-DWT) and histogram colour moments are taken into account to design this descriptor.

The second approach to index the image for retrieval is proposed by combining two colour features namely colour histograms and colour coherent vector.

In order to design the third enhanced feature descriptor, the shape and colour features have been considered. In this case, the edge colour information is taken as the feature descriptor for indexing images.

All the proposed techniques are tested by using the same publicly available databases used to analyze the performance of individual features. The performance comparison of the proposed techniques against the existing techniques is presented. According to the test results the performance of the proposed descriptors is significantly better than that of individual features.