Abstract

The desire of better and faster retrieval techniques has always fuelled to the research in content based video retrieval (CBVR). The extended comparison of innovative content based video retrieval (CBVR) techniques based on feature vectors as partial coefficients of transformed video frames using various orthogonal transforms is presented in the paper. Here the popular transforms are considered like Cosine, Walsh, Haar, Sine, and Fourier transforms. The advantage of energy compaction of transforms in higher energy coefficients is taken to reduce the feature vector size per video by taking partial coefficients of transformed video frames. Reduced feature vector size results in less time for comparison of feature vectors resulting in faster retrieval of videos. The features are extracted in eight different ways from the transformed image. First all the coefficients of transformed image considered as 100% energy and then seven reduced coefficients sets are considered as feature vectors (as 99%, 98%, 97%, 96%, 95%, 90% and 85% energy of complete transformed video coefficients). To extract Gray feature sets the five video transforms are applied on gray image equivalents and the color components of videos. Then these seven reduced coefficients sets are used instead of using all coefficients of transformed videos as feature vector for video retrieval, resulting into better performance and lower computations. The video database of 500 video spread across 10 categories is used to test the performance of proposed CBVR techniques. 500 queries are fired
on the database to find average accuracy values for all feature sets per transform for each proposed CBVR technique. The results have shown performance improvement (higher accuracy values) with partial coefficients compared to complete 100% energy of transformed video frames at reduced computations resulting in faster retrieval. Haar transform surpasses all other considered transforms in performance with highest accuracy values with 90% of partial energy coefficients and size is lowered by 99.93% as compared to other transforms.

References

Comprehensive Performance Comparison of Fourier, Walsh, Haar, Sine and Cosine Transforms for Video Retrieval with Partial Coefficients of Transformed Video

- Sudeep D. Thepade, Nalini Yadav, "Assessment of Similarity Measurement Criteria in Thepade’s Sorted Ternary Block Truncation Coding (TSTBTC) for Content Based Video Retrieval.", 2015 International Conference on Communication, Information & Computing Technology (ICCICT), Jan. 16-17, Mumbai, India

Index Terms

Computer Science Applied Mathematics

Keywords

Cosine Transform Haar Transform Walsh Transform Fast Fourier Transform Sine Transform.