Abstract

Because of the rising demand from wide range of applications the need of faster and better image retrieval techniques is growing day by day. Dimension reduction of CBIR feature vectors has gained momentum for swift image retrieval. The paper presents few novel techniques for image retrieval based on principal component analysis (PCA). Here feature vectors are eigenvectors of covariance matrix obtained using the row mean, column mean, forward diagonal mean, backward diagonal mean and mean combinations of database images. Instead of taking all pixels of database images for PCA, proposed CBIR methods use mean vectors, thus dimension of feature vectors used for image retrieval is reduced resulting in faster retrieval. The proposed CBIR techniques are tested on two different image databases, general image database (1000 images spread across 11 categories) and COIL image database (1080 images spread across 15 object categories). For each proposed CBIR technique 55 queries are fired on general image database, 75 queries are fired on COIL image database and net average precision and recall are computed. The experimental results show that proposed CBIR techniques gives the better performance in terms of higher precision and recall values with lesser computational complexity than the conventional PCA based CBIR using complete image
data.

Reference

- http://wang.ist.psu.edu/docs/related/Image.orig (Last referred on 23 Sept 2008)
uploaded on online Springerlink.


- Ng, Raymond T.; Sedighian, Andishe, “Evaluating multidimensional indexing structures for images transformed by principal component analysis”, Proc. SPIE Vol. 2670, p. 50-61


CBIR Feature Vector Dimension Reduction with Eigenvectors of Covariance Matrix using Row, Column and Diagonal Mean Sequences


Index Terms

Computer Science

Image Processing

Key words

CBIR

PCA

Eigenvectors

Row Mean

Column Mean

Diagonal Mean