Performance Comparison of Face Recognition using DCT and Walsh Transform with Full and Partial Feature Vector Against KFCG VQ Algorithm

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Abstract
Aim of this paper is to compare the performance of transform based face recognition technique with vector quantization (VQ) based face recognition technique. Transform based face recognition technique considers full and partial feature vector of an image. 2D-DCT and Walsh transform is applied on the resized image of size 128x128, to obtain its feature vector. Partial feature vector is obtained by selecting 75% rows and columns of feature vector, 50% rows and columns of feature vector and so on. The smallest size of partial feature vector is selected as 4x4. Transform based technique is tested on two different databases. Georgia Tech Face Database contains JPEG color images and Indian Face Database contains bitmap color images of varying size. Recognition rate is calculated for varying size of selected feature vector using DCT and Walsh transform. Also computational complexity in terms of number of CPU units is calculated in both the cases: with full feature vector and with partial feature vector. Then KFCG-VQ algorithm is applied on both the databases. Results of above transformation techniques and computational complexity are compared with the results obtained by KFCG-VQ algorithm. Results show that, KFCG outperforms both transformation techniques with full and partial feature vector consideration and gives less computational overhead by reducing it by 600 times than DCT and by 70 times than Walsh transform.

Reference

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- “Georgia Tech Face Database” at http://www.face-rec.org/databases.

**Index Terms**

Computer Science

Wireless

**Key words**

Face recognition

DCT

Walsh

KFCG
Vector quantization