Abstract

Fingerprints are the most widely used form of biometric identification. Fingerprint identification has become time-consuming because of growing size of fingerprint databases. Fingerprint classification can be one of the significant preprocessing steps to improve the accuracy of fingerprint identification systems and is done to put a given fingerprint to one of the existing classes. Classifying fingerprint images is a very difficult pattern recognition problem, due to the possible problem with accuracy which is a measure of how well the system is able to correctly match the biometric information from the same person and avoid falsely matching biometric information from different people. In this research an experiment was conducted and a comparative analysis based on vector quantization for fingerprint classification using Kekre's Median Codebook Generation (KMCG) was done using codebook sizes 2, 4, 8 and window sizes 2*2, 4*4, 8*8, 16*16, 32*32, 64*64. KMCG is one of the better and faster vector quantization codebook generation methods. Fingerprint images were obtained from the National Institute of Standards and Technology (NIST) special database 4 for this study. It was observed that the method effectively improves the computation speed and provides accuracy of A (Arch)
by 99%, TA (Tented Arch) by 98%, LL (Left Loop) by 100%, RL (Right Loop) by 100% for codebook size 4 and LL (Left Loop) by 99% accuracy for codebook size 8 and window size 8*8. Codebook size 2, 4 exhibited overall better percentage accuracy of classification than codebook size 8.

References


Index Terms

Computer Science Algorithms
Keywords

Vector Quantization, KMCG, NIST, Fingerprint Classification.