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Texture Features in Palmprint Recognition System

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ABSTRACT

This paper describes the algorithm used for personal identification based on features extracted from the palmprint. The local Gabor XOR (LGXP) features is built using Gabor filter with orientation. Initially, the palm print images are preprocessed using median filter. The algorithm is then modified, where features are extracted with different orientations of the Gabor filter called the multiple orientation LGXP (MOLGXP) features. The PCA feature is extracted and fused with MOLGXP and PCA using sum rule.

KEYWORDS

Gabor, LGXP, PCA

INTRODUCTION

The multibiometric systems with multiple biometric sources is designed to build Biometric systems. Multibiometrics is expected to alleviate some of the limitations of unimodal biometric systems. In multi-algorithm based multibiometric systems, the same biometric trait is processed using multiple algorithms. Biometric systems based on palmprints have gained preference due to ease of acquisition, high user acceptance, non-intrusiveness, reliability and stable structural features. Palmprint based personal identification is a potential and a very effective biometric system since it offers widely discernible and discriminating features like principal lines, wrinkles, ridges and minutiae points. Today, palmprint recognition plays a significant role in the area of network multimedia information access and also palmprint is comparatively new biometric technology. The palmprints recognition system is depicted in Figure 1.

LITERATURE SURVEY

This paper presents an overview of palmprint and its related work. The palm is defined as the inner surface of our hand from the wrist to the root of fingers. Yoti Malik et al. (Malik et al., 2011) introduced a fast complex Gabor wavelet based palmprint authentication. Shashikala & Raja (Shashikala & Raja, 2012) presented a palmprint identification based on DWT, DCT, and QPCA. Histogram equalization is employed to palmprint improve dissimilarity of an image. Priya Dudhanale & Ganorka (Priya Dudhanale & Ganorka, 2014) carried out a study of person identification using palmprint recognition system based on minutiae cylindrical code. Haifeng Sang et al. (Sang et al., 2013) presented a robust palmprint recognition based on touch-less color palmprint Images. Cappelli et al. (Cappelli et al., 2012)

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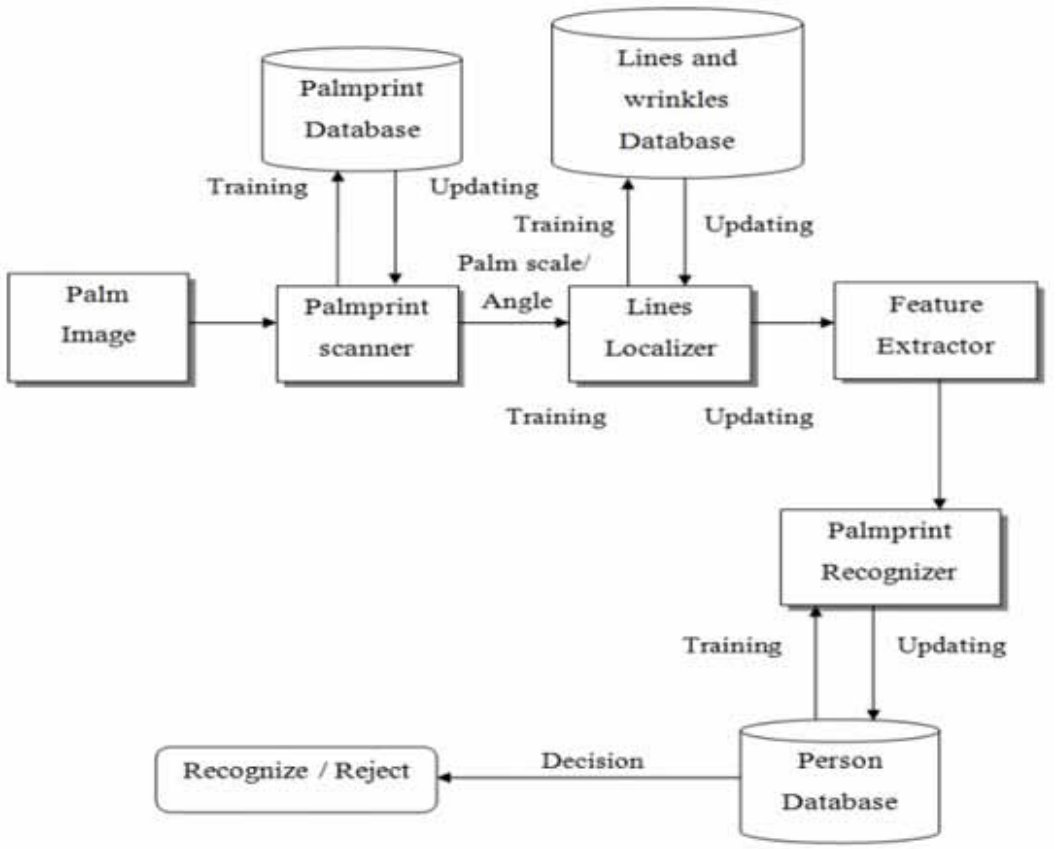
Figure 1.



made use of a fast and accurate palmprint recognition system based on minutiae. Here, a high-resolution palmprint recognition system is designed depending on minutiae. Aditya Tirodkar et al.(Kekre et al., 2011) performed an evaluation of palmprint recognition techniques using DCT. Nibouche et al. (Nibouche et al., 2012) made an analysis of the performance of palmprint matching. Here, a novel and easy palmprint recognition solution derived from sparse representation is developed. Subhajit Karar & Ranjan Parekh (Karar & Parekh, 2013) presented palmprint recognition using Phase Symmetry. Zhang et al. (Wu et al., 2003) discussed an online joint palmprint and palm vein verification. Mani Malek Esmaeili et al. (Esmaeili et al., 2011) analyzed a robust and fast video copy detections system using content-based fingerprinting. A video copy detection system depended on content fingerprinting and utilized for video indexing and copyright applications are presented. Sandeep Kaur & Gaganpreet Kaur(Kaur & Kaur, 2013) explored an optimized palm recognition using cuckoo search algorithm. Siddharth et al. (Siddharth et al., 2014) presented an authentication by palmprint recognition using phase-difference trained by probability neural network. Xuan Wang et al.(Wang et al., 2013) briefed an on-line fast palmprint identification based on adaptive lifting of wavelet scheme.

Research has shown promising results on employing these approaches individually. However, efforts are still require to achieve higher performance for their use in higher security application. These unimodal approaches rely on the evidence of a single source of information for authentication of person. Noisy data, intra-class variation, interclass similarities, non-universality, spoofing, etc., problems are imposed by unimodal biometric systems which tend to increase false acceptance rate (FAR) and false rejection rate (FRR), ultimately reflecting towards poor performance of the system.

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