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ENHANCEMENT AND ESTIMATION OF LATENT FINGERPRINT

A.Divya,R.Mohanapriya, S.Sankari, R.Sindhuja, Ms.P.Vinothini,M.E., (AP/CSE).
Department Of InformationTechnology.
BHARATHIYAR INSTITUTE OF ENGINEERING FOR WOMEN,
Deviyakurichi, Salem.

Abstract

Fingerprint sensibility application is mostly used application in security related areas in a modern world.In this areas in an elastic distortion of fingerprints is one of the major causes for mis-match.Such a way the malignant users may purposely distort their fingerprint to avoid identification, so our proposed system should introduce the novel algorithm to identify and improve skin distortion based on a single fingerprint image. Distortion rectification is viewed as reverting problem, where the aid is distorted fingerprint and the achievement is the distortion field. to unriddle this obstacle, a database of different distorted reference fingerprints and distortion field is assembled in the offline stage and then online stage, the nearest neighbor of the input fingerprint is encountered in the reference database and the comparable distortion field is used to switch over the input distorted fingerprint into normal one.

Keyterms: malignant, distortion, rectification.

I.INTRODUCTION

Latent fingerprints are usually used to validate a person's identity because of its unique characteristics. Latent fingerprints are consequence of fingers left on surfaces. Such impressions are usually not directly visible. There are some challenges in latent fingerprints matching like confused environment, large distortion, and Partial fingerprint. By taking the reference from spelling correction techniques in natural language processing, system propose a novel fingerprint orientation field estimation algorithm based on before principles of fingerprint structure. Latent fingerprints play an essential role in detecting criminals in many wrapping. So an sufficient method to enhance latent fingerprint is necessary to identify the actual criminals. In this method, latent fingerprint is enhanced using prior knowledge of fingerprint structure. A dictionary of reference, orientation patches is constructed using a set of orientation fields taken from high quality fingerprints. For orientation field estimation of latent fingerprints, ridge orientations at different locations of fingerprints have distinct aspects, we propose a localized dictionaries-based

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orientation field estimation algorithm, A number of orientation patches extracted from real fingerprints are clustered to form a dictionary and noisy orientation patches are replaced by closest real orientation patches in the dictionary.

I. PROBLEM STATEMENT

Finger print sensibility system still exists several exact research problems, for example, recognizing low quality fingerprints. Fingerprint matches are very sensitive to image quality, where the matching accuracy of the same principle varies extremely among various data sets due to variation in image quality. The difference between the ac-curacies of plain, rolled and distorted fingerprint matching is even larger as observed in technology evaluations. Fingerprint reduction due to skin distortion has not yet received sufficient attention, despite of the importance of this problem. This is the problem this paper struggle to address. Note that, for a negative fingerprint sensibility system, its security level is as delicate as the weakest point. Thus it is necessary to develop distorted fingerprint (DF) identification and rectification algorithms to fill the hole.

Disadvantage:

- System result is threatening in negative recognition system.
- System was producing invalid non-matches.
- Reproduction of data exists.
- Fingerprints are distorted easily by malignant users.
- System cannot identify distorted fingerprint images in existing fingerprint images.

II. PROPOSED SYSTEM

Our algorithm aims to reconstruct the orientation fields of component prints by modelling fingerprint orientation fields and then perfect it using terminology based approach. In order to facilitate this, we utilize the orientation cues of intrinsic fingerprints, which are manually marked by fingerprint examiners. The proposed orientation field estimation principle consists of an offline dictionary construction stage and an online orientation field estimation stage. In the offline phase, a set of good nature fingerprints of various pattern types (arch, loop, and whorl) is manually selected and their orientation fields are used to design a dictionary o f orientation patches. In the on-line stage, given a fingerprint illustration, its orientation field is automatically calculating using the following steps:

1) Initial estimation: The initial coordination field is obtained using a local orientation estimation method, such as local Fourier investigation.

2) Terminology lookup: The initial coordination field is divided into overlapping patches. For each initial orientation patch, its six nearest neighbor in the dictionary are viewed as candidates for replacing the noisy initial orientation patch.

3) context-based rectification: The excellent combination of candidate orientation patches is found by considering the compatible between neighboring orientation patches. In the following subsections, we first describe the offline terminology

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design and then present the three steps in the on-line orientation field estimation algorithm.

SYSTEM ARCHITECTURE

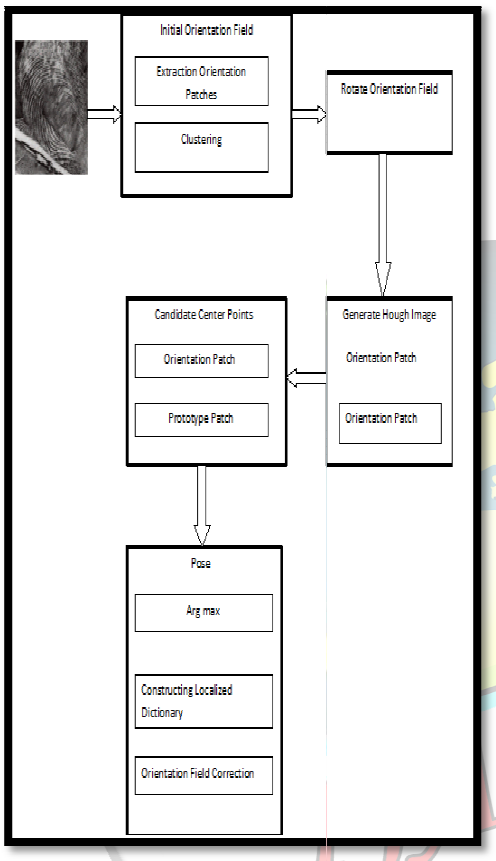

Fig: Block diagram of system architecture

A. Mathematical model of proposed system

1) Notarization technique for noise removal

2) Orientation Field Estimation.

3)Finger Center Estimation principle.

4) Fake Estimation Algorithm.

5) Localized Dictionary based algorithm

Let the system be described by S,

S= {D, BT, OF, FC, PE, LDBA, O}

Where

S: is a System.

D: is set of Datasets

BT :Binarization technique.

OF: Orientation Field Estimation.

FC: Finger Center Estimation Algorithm.

PE: Pose Estimation Algorithm.

LDBA: Localized terminology based algorithm

O:Output.

Action

D= {d1, d2 ...dn}

LD={Dictionary}

Y= {BT, OF, FC, PE, LDBA}

Z= {O}

D: is set of Datasets

LD: Set of Localized Dictionary.

Y: Set of System Modules.

Z: Output

III. MODULE DESCRIPTION

1.Fingerprint distortion detection:

It is viewed as a two class classification problem.we used the registered ridge adaptation map and duration map as the

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feature vector,which is classified by svm classifier.fingerprint registration in order to selection meaningful feature vector,fingerprints have to be registered in a fixed coordination system. The reference fingerprints are prepared in the offline stage and how to register and input fingerprint in the online stage

2. Statistical modeling of distortion fields:

In order to learn statistical fingerprint distortion model.the distortion field between paired fingerprints in the training set.the distortion field between a pair of fingerprint can be appraisal based on the corresponding minutiae of the two fingerprints**.**

3.Distorted fingerprint rectification**:**

A distorted fingerprint can be thought of being generated by applying on unknown distortion field to the normal fingerprint which is also unknown.if we can calculate the distortion field d from the given distorted fingerprint.we can easily rectify into normal fingerprint by applying the inverse of d address a regression problem,which is quit difficult of the high dimensional of the distorted fingerprint.the nearest neighbor regression approach is used for this task the proposed distortion fingerprint rectification algorithm consist of an offline stage and online stage**.**

4.Distorted reference fingerprint database:

To accomplish the database of distorted reference fingerprint,we use ref 1/4 100 normal fingerprint fvc2002 db.the distortion fields are generate by uniformly sampling the subspace connect by the first two principle components example of generating distortion filed and assign such as distortion range to reference fingerprint to generate corresponding distorted fingerprint.

5.Distortion field estimation by nearest neighbor search **:**

Distortion field estimation is equal to finding the nearest neighbor among all distorted resource fingerprint.the similarity is measured based on level one feature of fingerprint namely ridge orientation map and period map.

IV. CONCLUSION

False non-match rates of fingerprint matches are very high in the case of severely distorted fingerprints. This generates a security hole in automatic fingerprint sensibility systems which can be utilized by criminals and terrorists. For this reason, it is significant to develop a fingerprint distortion detection and rectification algorithms to fill the hole. This paper represents a novel distorted fingerprint identification and rectification algorithm. For distortion detection, the registered ridge adaptation map and duration map of a fingerprint are used as the feature vector and a SVM classifier is trained to classify the proposal fingerprint distorted fingerprint and then the reverse of the distortion field is used to transform the distorted fingerprint into a normal one. The trial results on FVC2004 DB1, Tsinghua DF database, and NIST SD27 database showed that the proposed algorithm can improve sensibility rate of distorted fingerprints evidently.

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