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Recognition of Finger mark using CNN

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ABSTRACT: In present-days, the technological development in the field of data collection, processing, storing along with the field of research in pattern recognition, machine learning and deep learning serves abiometric person recognition processing fingerprint. In this work, the proposed model is a classificationsystem to recognize and match images of fingerprints. ACNN architecture is used to develop a model for detection. The present study uses approach to ensure the performance of the system. Finger print recognition system used for identifies the entity who involved in the database helps to automate fingerprint identification process. Preprocessing was performed with fingerprint thinning and minutiae extractionwithmethod. Feature extraction will be done by the CNN classifier.

Keywords: [Image Processing, Python Language, CNN.]

1. INTRODUCTION

Biometriccharacteristicsandthedifferentattributesallowpeopletos uccessfullyidentifyandauthenticatethevariousaccesscontrolforna tionalandglobalsecuritysystem.authenticationtechnologiesareuse dinsecurityawareness in many places, with increasing financial activities. Traditional authentication such as passwords, personalidentificationnumbers, smartcardswerelargelyunabletomeetconvenience, reliabilityandsecurityrequirements in a wide variety of applications Such traditional methods for acquisition of fingerprint imagesby pressing finger against the surface that are hard (such as, silicon, glass, polymer, etc) can often lead to apartial or degraded images due to placement of improper fingers. As a result, full fingerprint potential is notrealized. Hygiene is serious issue in contact-based system. To address issues mentioned in above technique, touch less finger imaging systems have emerged in the recent years. As unique data is available from fingerprint images, suchapproach canbeused ingettingaccuratepersonalidentification

2. METHODOLOGY

Block Diagram

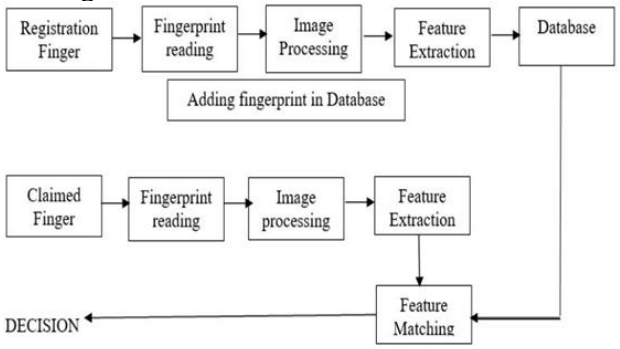


Figure.1Data Logger

Registration Finger-: In this process we take fingerprint as input and store it in database
Fingerprint Reading-:
Afterregistrationoffingerouralgorithmreadsthefingertoextractthe features.
Image processing-:
Inthisblockvariousoperationareperformedontheimagetoenhancei tsqualityand clarity for extraction of features.
Feature Extraction-:
Inthisblockvariousfeaturesoffingerprintareacceptedlikevariousc haracteristicspoint of minutaepoint
Database-:
Inthisphaseextractedfeatureofregistredfingerprintarestoredtoco mpareitwiththeotherfingerprint for matching.
Claimed Finger-:
Nowclaimedfingeriscapturedtomatchitwithregisteredfingerandsa meoperationare performed on as there gistered fingerprint.
Feature Matching-: In this block the feature are matched for recognition Flow Diagram

3. EXPERIMENTATION

Steps-:

EnrollingFingerprint-:
Formatchingfingerprintfirstwehavetodofingerprintregistrationan dextractingfeatures from fingerprint. For contactless fingerprint we have to capture images of fingerprint from anycamera device.[2] The quality of images obtained from this devices may not be high quality images so wehave to performoperationsonour imageto makeitmoreclear.
FingerprintEnhancement-:
Afterenrollingfingerprintweperformfingerprintenhancementono urimages.
Itincludes-;
Normalization:
Aninputfingerprintimageisnormalizedsothatithasaprespecifiedm eanandvariance.
Local orientation estimation: The orientation image is estimated from the normalized input fingerprint image.
Localfrequencyestimation: The frequencyimageiscomputedfromthenormalizedinputfingerprinti mageandtheestimated orientation image.
Region mask estimation: The region mask is obtained by classifying each block in the normalized inputfingerprintimageintoarecoverable or aunrecoverable block.
Filtering: A bank of Gabor filters which is tuned to local ridge orientation and ridge frequency is appliedto the ridge-and-valley pixels in the normalized input fingerprint image to obtain an enhanced fingerprintimage.

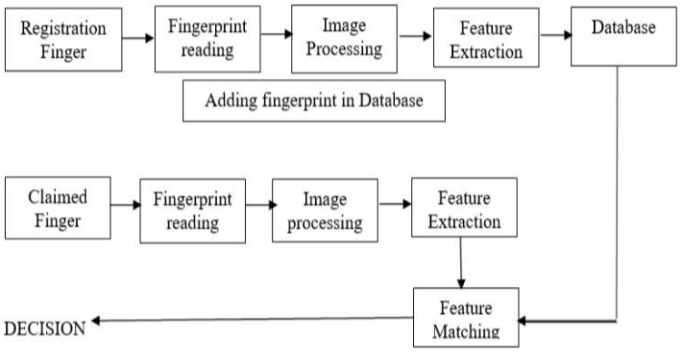


Figure.2 Finger print Enhancement

Feature Extraction Using CNN-: A CNN is not only a deep neural network with many hidden layers butalsoalarge networkthatsimulatesandunderstandsstimuliasthevisualcortexofthebrainprocesses.

CNN is a neural network that extracts input image features and another neural network classifies the image features. The input image is used by the feature extraction network.

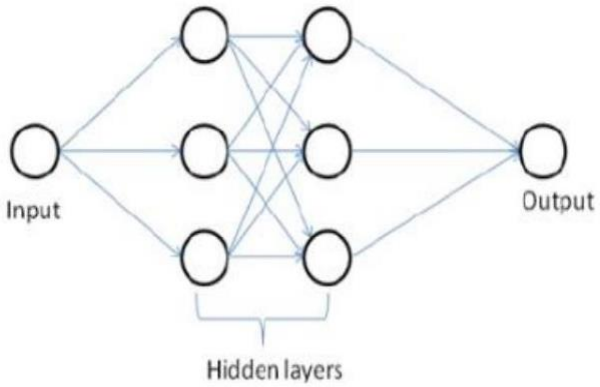
The neural network classification then workson the basis of the image features and produces the output.

The neural network for feature extraction includes convolution layer piles and sets of pooling layers. As its name implies, the convolutionlayertrans forms the image using the process of the convolution.

It can be described as a series of digital filters. The layer of pooling transforms the neighboring pixels in to a single pixel.

The pooling layer then decreases the image dimension. As CNN's primary concern is the image, the convolution and pooling layers' procedures are intuitively in a two-dimensional plane. This is one of CNN's distinction swith other neural networks.

By extracting features we can now move forward to our next step i.e. to compare the input to our extracted features.



Convolutional Neural Network

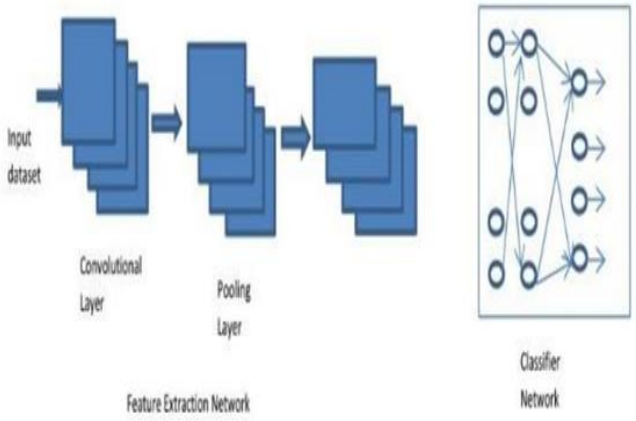


Figure.3 Convolutional Neural Network

4. Result

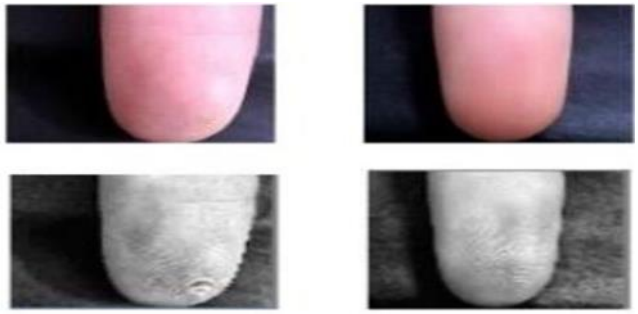


Figure.4Processed images of finger print

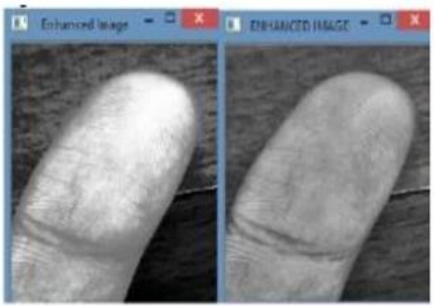


Figure. 5 Image swith contrast adjustment

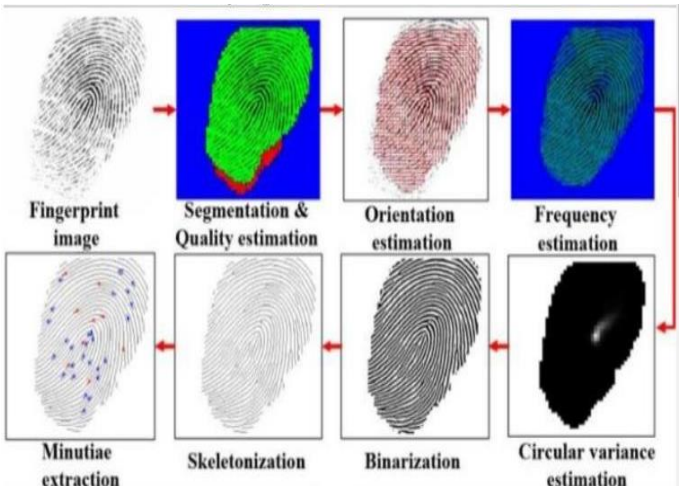


Figure.6 Feature Extraction of Fingerprint

CONCLUSION

In contactless fingerprint systems, especially for un-pinned and unconstrained setups, the presence of incorrect alignments and excessiverotations of the finger candrastical lyre duce the recognition accuracy of the biometric system. Amodelistestedwhichachievedmoreaccurateidentification.

Higher accuracy of recognition, lowcomplexity and lowstoragerequirementscanmakeit popular for deployment. Easy implementation.

REFERENCES

[1]. Neeraj Bharagava, Anchal Kumawat, Ritu Bharagava (2015). "Fingerprint Matching of Normalized Image based on Euclidean Distance". International Journal of computer Application.Volume120-No 24.

[2]. R.Donidalabati, A.Genovese, V.Piuri and F.Scotti," Touchless Finger print Biometrics: A survey on 2D and 3DTechnologies",injournalofinternettechnology, 2014.

[3]. A. Ross and A. Jain, "Biometric sensor interoperability: A case study in fingerprints." Proc. Bio AW,LNCS 3086, Springer, 2004, pp. 134–145. 17. Arun Ross and Rohan Nadgir, "A Thin-Plate Spline Calibration Model.

[4]. KarenSimonyan Andrew Zisserman," Two-Stream Convolutional Networks for Action Recognition in Videos",

Neural Information Processing Systems, 2014,Vol1,pp.568-5.
[5]. V. Piuri and F. Scotti, “Fingerprint biometrics via low-cost sensors and webcams,” in Proc. 2nd IEEE Inte. Conf. onBiometrics: Theory, Applications and Systems, October 2008,pp. 1–6.
[6]. F. Han, J. Hu, M. Alkhathami, and K. X “Compatibility of photographed images with touch-basedfingerprintverificationsoftware,” inProc.IEEE Conf.onIndustrial ElectronicsandApplications,June2011, pp. 1034 – 1039.
[7]. H. Choi, K. Choi, and J. Kim, “Mosaicing touchless and mirrorreflected fingerprint images,” IEEETrans.Inf.ForensicsSecurity,vol. 5, no. 1,pp. 52– 61,March 2010.