Face Recognition Using Multiagent Technology System

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Abstract: **In today's sensitive environment, there are so many biometric technologies including face recognition are available for person recognition and are coming of age due to the need to address sensitive security concerns in the 21st century. But, the single biometrics technique is not adequate for person identity recognition due to both sufficiently accurate and user acceptable for universal application. The main challenges of face recognition today are handling & implementing the different stages of face recognition such as capturing face, the feature extraction stage, Color segmentation, Skin-region detection stage, the template acquisition and classification stage are spatially and functionally distributed, with complex hierarchies of security levels and interacting user requirements. An approach based on innovative multi-agent based computing paradigm is sufficient & promising towards the face recognition systems deployed in such distributed environments.**

Keywords: **face recognition, Eigenfaces, Multiagents.**

I. INTRODUCTION

Face recognition and other biometric technologies like fingerprint, voice, gait, iris, retina, palm geometry, vein patterns, are available for person recognition and are coming of age due to the need to address sensitive security concerns in the 21st century. One of the most recent biometric identification techniques is Face recognition, which can recognize an individual person based on their facial features as essential elements of distinction[8]. Here we consider the problem as for given still or video images of a particular scene, the identification of one or more persons in the scene using the technique from the stored database of faces. Correlation method is the first approach used for face recognition. The two important approaches for face recognition are: geometric (feature based) and photometric (view based)[3]. The three different algorithms developed by researchers are: Principal Components Analysis (PCA), Linear Discriminant Analysis (LDA), and Elastic Bunch Graph Matching (EBGM).

Biometric recognition systems based on face recognition have shown excellent performance in the area of secured to buildings/ airports/seaports, border checkpoints, law enforcement, surveillance systems and so on. Face recognition problem is very challenging because of variations in different face images of the same person due to changes in facial expressions, multiposes, illumination conditions, rotation, age, and presence of beard, moustache and etc.,

The architecture consists of a fusion of multi-layered structural and functional models in a network-oriented distributed environment.

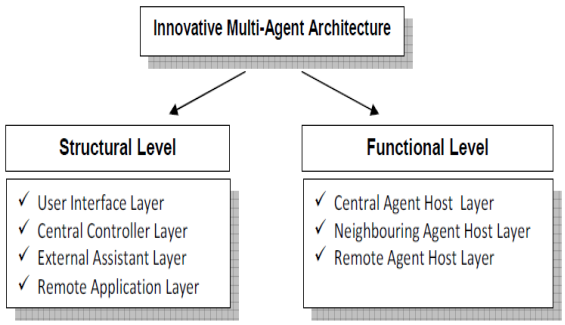


Fig. 1 Innovative Multi-Agent Architecture

II. EXISTING SYSTEM

Eigenfaces Approach

Eigen space-based approaches approximate the face images with lower dimensional feature vectors[2]. To produce the low dimension feature vectors let us consider that the face space given by the feature vectors has a lower dimension than the image space represented by the number of pixels in the image. Again the face recognition can be performed in this reduced space. This complete procedure considering the training to create the face database, the projection matrix to achieve the dimensional reduction is obtained from the database of face images.

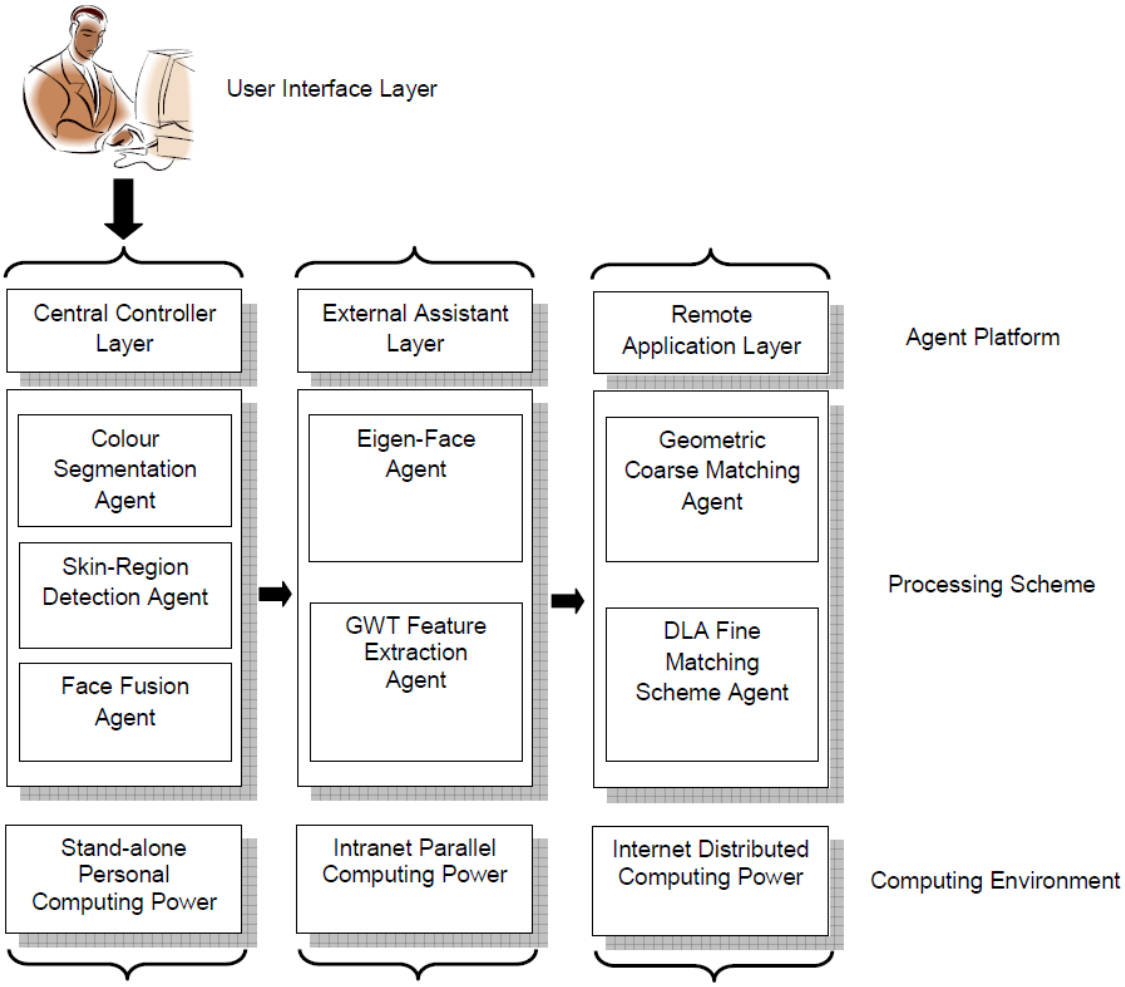


Fig. 2 Multi-Agent based Face Biometric System Architecture

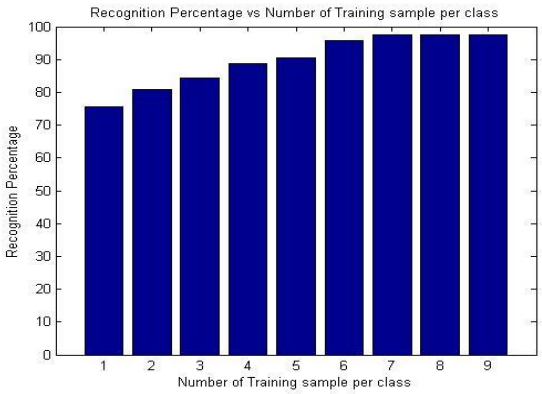
III. PROPOSED SYSTEM

Form the Training Set, collecting the initial set of face images.

- Define the face space of M images by calculating eigen faces from the training set keeping only M images corresponding to the highest eigen values
- Calculate distribution in this M-dimensional space for each known person by projecting their face images onto this face-space. Projecting this new image onto each of the eigenfaces, calculate a set of weights based on M eigenfaces for a given input image.
- Determine whether the image is face or not by checking if the image is sufficiently close to face-space.
- For faceimage, the weight pattern is classified as either known or unknown person.
- The weight pattern can be compared with known weight patterns to match faces.

IV. RESULTS AND DISCUSSIONS

The training set of images in fig.5 is given as input to find eigenspace. Using these images, the average face image is computed. The covariance matrix represents the difference of these images. This is used to calculate Eigenvectors and Eigen values in fig.8. These are the Eigen faces which represent various face features. So for given two test images are projected onto this eigenspace to give the weight vector also known as Face key for that image. The Euclidean distance between these two face key vectors is calculated.



REFERENCES

[1] Annapurna misra, Monorama Swain and Bodhisattva Dash,"An Approach to Face Recognition of 2-D images using Eigen Faces and PCA", Signal & image processing: An International Journal (SIPIJ), Vol.3, No.2, April 2012.

[2] Rajeev Gupta, "Multi- Agent Approach towards Face Recognition", International journal of Computing and corporate Researh, Vol.1, Issue.3, Nov 2011.

[3] Kishore Golla, Sunand.G, Rajesh Babu.N, "Face Recognition using Eigen faces by ANN with resilient Back propagation Algorithm", International Journal of Emerging Technology and advanced Engineering, Vol.2, Issue.11, Nov 2012.

[4] Taranpreet Singh Ruprah, "Face Recognition Based on PCA Alorithm", special issue of International Journal of Computer Science & Informatics (IJCSI), Vol.2, Issue.1.2.

[5] Shahrin Azuan Nazeer, Nazaruddin Khalid, and Rbiyah yusof, "Face verification and Recognition based on Learning Algorithm".

[6] Yao-jiunn chen, yen-chun lin,"Simple Face-detection algorithm based on Minimum Facial Features", the 33rd Annual Conference of the IEEE industrial Electronics Society(IECON), Nov 2007.

[7] Rashmi Gupta, Anil Kishore Saxena, "Survey of Advanced Face Detection Techniques in Image Processing", international journal of Computer science and management Research, Vol.1, Issue.2, Sep.2012.

[8] Yasufumi suzuki, Tadashi Shibata, "An Edge Based Face Detection Algorithm Robust Against Illumination, Focus, And Scale Variations".

[9] Hamid Tabatabaee yazdi, Amin Milani Fard, Mohammad-R, Akbarzadeh.T, "Cooprerative Face Recognition in Distributed Web-Environment", IEEE, Vol.8, 2008.