



Research Findings and Future Scope of Studies in Neural Network Architecture and Machine Learning Approaches for Image Retrieval

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Abstract— This technique uses visual contents to search images from large scale image databases according to the user's interest. The features refers to color, shape, texture that can be derived from the image. In this paper an image retrieval system using artificial neural network (ANN) in MATLAB with the help of wavelet transforms is contemplated. In the proposed system, mean and standard deviation of the images are calculated later to the filtering process of the images using wavelet transforms. Using the neural network classifier the system is trained and tested and classifies the images from a vast database relevant to the requirement. A database having 1000 images spread across ten categories is taken for the implementation purpose. Net average precision and recall values are computed for the database query. The obtained results show the performance improvement with higher precision and recall values.

Keywords: Image Retrieval, Back Propagation, Neural Network

1. NEURAL NETWORK ARCHITECTURE

Artificial neural networks (ANN) say that the foremost active analysis and application a locality is classification. The neural network was trained by back propagation algorithmic rule. The dataset classification uses the foremost effective tool known as back propagation neural network. The usage of Back Propagation Neural Network (BPNN) for classifying the images in remote sensing technology is additionally examined. Once the maximum likelihood technique was compared with back propagation neural network technique, the BPNN was a lot of correct than maximum likelihood technique. The classification of neck movement patterns associated with Whiplash-associated disorders (WAD) uses a resilient back propagation neural network (BPNN). The resilient back propagation neural network (BPNN) resulted during a correct prediction for 84 p.c of the management subjects and 89 p.c of the WAD, showing that a BPNN might be appropriate for

predicting motion characteristics. The applied math analysis technique for purifying training samples for remote sensing classification supported BP ANN is performed. The experiments showed that it absolutely was a good technique to enhance image classification. Analyses of breast cells characteristics have nice importance in diagnosing, treatment and following of this unwellness. During this study, classification of 699 instances of carcinoma knowledge that's

on the market in UCI is performed through artificial neural network algorithmic rule. Multilayer feed-forward neural network algorithmic rule is additionally used for classification, application of misfire detection in petrol engines, classification of seat materials etc. but BPNN proves to be simpler than alternative classification algorithms.

A study of various color and texture options for image retrieval in CBIR is performed. Numerous methods are available for feature extraction in CBIR. They're known and studied to grasp the image retrieval method within the CBIR systems. Studies created on experiment results show that the strategy supported hybrid combination of color and texture options has higher retrieval accuracy than the opposite strategies supported single feature extraction. Color moments, haar wavelet, daubechies wavelet and dmey wavelet transformation techniques are thought of for retrieval. It's tough to say that one feature is superior to others. The performance depends on the color distribution of images. Similarly, Texture feature may be combined with color moments or color bar graph to urge correct results for image retrieval. From the studies, it's found that only one color feature or texture feature isn't spare to explain a image. There's sizeable increase in retrieval potency once each color and texture options are combined. Additionally we've reviewed varied papers associated with completely different classification strategies for the development of image retrieval in CBIR. Among completely different classification strategies, Neural Network classification is associate economical technique for image retrieval. It takes into consideration the characteristics of relevant and orthogonal images. Neural Network classification has significantly improved the recall rate and additionally retrieval time, because of its extremely economical and correct classification capability.

Image quality assessment for aliveness sightion technique is employed to detect the pretend bioscience. because of Image quality measurements it's simple to search out real and pretend users as a result of fake identities perpetually have some different options than original it perpetually contain different color and brightness level levels, general artifacts, amount of knowledge, and amount of sharpness, found in each style of images, structural distortions or natural look. Multi-Biometric system is difficult system. it's safer than unibiometric system.

2. MACHINE LEARNING APPROACH FOR MULTI BIOMETRIC CLASSIFICATION

A novel joint sparsity-based feature level fusion algorithmic rule for multimodal bioscience recognition is projected. Faces were extracted from video sequence and are used for training. Iris and fingerprints are listed and options are extracted, supported these options authentication is allotted. Multimodal bioscience integrates completely different biometric techniques and overcome issues featured by single bioscience. It will face up to noise and occlusion. High price of hardware is one reason for its less usage in planet things. In future if the hardware price goes down then this may be enforced and demanding authentication may be done.

In future this work may be improved by mistreatment the advance rework techniques and advance algorithms to relinquish the strong security to the user knowledge in less time. The run time quality may be reduced considerably in close to future. bioscience may be a promising field for providing the protection for confidential knowledge. Among all bioscience, membrane is one in all the foremost fashionable biometric attribute. If membrane is cumulatively combined with the modalities, the system will have a stronger hardness and performance.

3. FUTURE SCOPE OF STUDIES

Future Challenges and Directions

Some of the algorithms mentioned higher than have achieved success on difficult datasets. Systems incorporating face recognition technology have already been deployed in police work, social networking, and film compartmentalization domains. Success in these applications continues to be restricted as variety of issues and analysis challenges stay unsolved or unaddressed. a short summary of those analysis problems, potential applications and open issues is given below.

3.1 .Larger and more challenging datasets

The field of face recognition from video lags behind alternative biometric fields in terms of dataset size. Early work on video-based face recognition used databases containing concerning twenty subjects. Today, datasets comprised of thousands of videos and many subjects are on the market to the general public, like the video collections featured by the Multiple Biometric Grand Challenge. however evaluations on databases of this size don't seem to be common. Likewise, large-scale compartmentalization tests are rare in academe, despite the very fact that video-indexing systems have an oversized quantity of information promptly on the market from movies, TV shows and net videos. Kim et al. have created nice strides towards addressing this downside by aggregating nearly 2000 YouTube videos of just about fifty celebrated individuals to create the YouTube Celebrities dataset. Further, face recognition from video represents a very tough downside due the infinite variety of doable look variations face sequences will span. the extent of problem of most current databases is even so lacking. police work quality

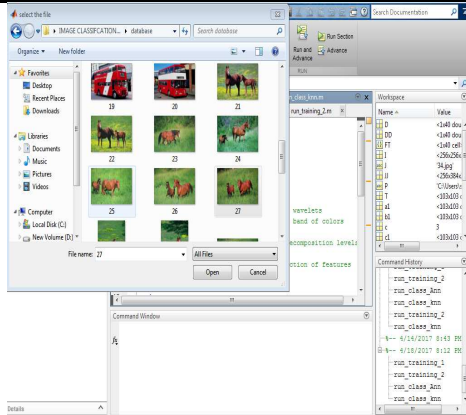


Fig 1.1 Selecting the query image

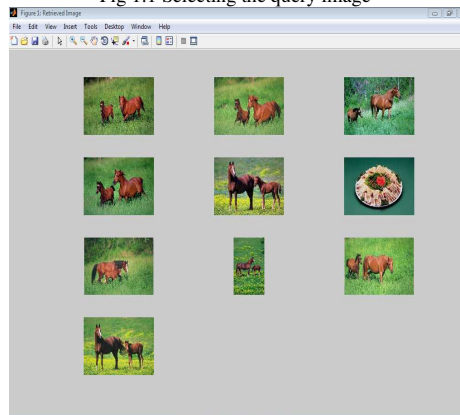


Fig 1.2 Displaying the results

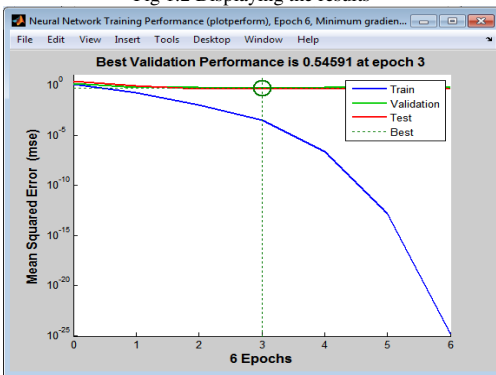


Fig 1.3 Performance plot

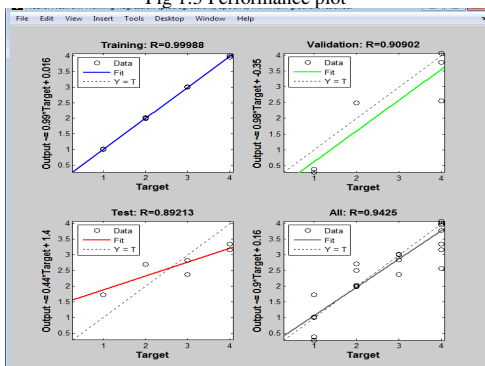


Fig 1.4 Regression plot



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video datasets that incorporate crowds of individuals, occlusions, vital amounts of noise and compression artifacts aboard variations in create, illumination and expression are necessary to gauge performance in uncontrolled environments. The performance evaluations for sequence-based strategies, especially, haven't historically drawn from such difficult knowledge. Conversely, the extent of problem for a dataset shouldn't be therefore high that it precludes the likelihood of researchers creating affordable progress. As strategies mature and their hardness to the nuisance factors continues to extend, this example ought to improve and therefore the problem levels of consecutive generations of analysis datasets ought to still increase.

3.2. The watch list task

In the bioscience domain, the watch list task is more challenging than those of verification and identification. It involves associate open set downside and so needs multiple selections. The face recognition system should confirm whether or not or not somebody is within the gallery and, if that person is found, come back a match. a lot of the present literature on face recognition from video ignores the watch list application and focuses on the verification and identification instead. However, watch list applications arise typically within the enforcement domain.

3.3. clustering applications

Research on face clustering has driven the event of video and image compartmentalization computer code, like Apple's iPhoto and Google's Picasa, that permits users to mechanically organize face image collections. clustering is that the method by that natural groupings or relationships inside knowledge are known. In video-indexing and retrieval applications, clustering may be wont to cluster face images or sequences of a similar person along once a info of best-known identities isn't on the market for matching. Such automatic process eliminates or reduces the burden of manually labeling thousands or scores of faces in videos or image albums from personal, film or news collections.

3.4. Video understanding applications

In domains wherever the performance on low-level tasks like identification and following is spare, a lot of complicated face recognition applications may be addressed . High-level tasks, particularly analyzing crowds, mechanically discovering social teams and determinant that people seem oftentimes in collection videos, represent however some of the long run applications of face recognition technology. as an example, Vallespi et al. propose a gathering understanding system for recognizing and enumeration meeting attendees. Face recognition-based strategies for mechanically understanding social network patterns in crowds of individuals determined by a police work camera network are conferred by Yu et al. Barr et al. sight people that seem outstandingly typically across a collection of videos showing connected events, with the concept that such people may well be involved these activities. The recent emergence of such high-level applications exemplifies the growing trend toward

mistreatment face recognition from video to grasp and track the complementary behaviors of people and teams.

3.5. Mobile devices

The ubiquitousness of mobile phones and pill devices equipped with digital cameras has introduced a large vary of doable applications for face recognition technology. As of early 2012, Google already provides biometric authentication computer code that enables a user to unlock automaton devices by presenting his or her face to the camera, whereas Apple recently filed a application for associate economical low threshold face recognition pipeline with stages for face detection, verification and basic aliveness detection Likewise, analysis on face recognition in mobile environments has largely targeted on the verification task. This little body of labor has addressed two styles of issues, the primary of that pertains to imaging conditions and therefore the second of that relates to process potency. Mobile devices generally deem inferiority cameras that always yield clattery and under- or over-exposed images. The captured images additionally tend to be extremely compressed to save lots of area. These problems are combined by the very fact that the devices are mobile, which suggests that the illumination conditions and backgrounds will vary considerably between images of a similar face. with reference to potency, though several new models of mobile devices incorporate moderate amounts of memory and multi-core processors with clock speeds close to or on the far side one rate, process speed continues to be a key issue since the these devices still lag way behind their immobile counterparts on the desktop or within the server area. As way back as 2005, Venkataramani et al. studied strategies for addressing the inferiority imaging noninheritable by mobile cameras. Hadid et al. conferred an easy nonetheless effective detection and verification theme that uses the Viola and Jones technique to search out faces and a neighborhood binary pattern intermediary for authentication in 2007. this technique was able to verify faces at a rate of 2 frames per second on a wise phone equipped with a 220 megahertz ARM nine processors. varied open problems and new applications stay. From a sensible position, verification on mobile devices may be a comparatively simple task, as users typically can get together by presenting their face at associate upright, frontal create inside a brief distance from the camera. False negatives and acquisition failures don't incur a big price as users will fall back to the standard PIN-based authentication interface. a way more challenging downside is to investigate faces in impulsive images and mechanically determine individuals by treating personal image albums as accidental galleries. a lot of economical strategies for detection, registration and identification are going to be needed before face recognition may be applied in such contexts. for example, very little work has been done on adapting strong face trackers to search out faces in mobile environments at impulsive distances from the camera. Face trackers are typically a lot of economical than detectors since they are doing not perform a full search over all of the frames, and that they will doubtless improve registration. sixty The potential analysis directions



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additionally extend into the domains of social network analysis and enforcement.

3.6. Multimodal approaches

Much of the analysis on face recognition from video has targeted on representing people in terms of the looks, structure or dynamics of their faces. On the opposite hand, a range of distinctive characteristics are generally visible and complementary varieties of info like audio typically accompany videos. info from the face will doubtless be coalesced therewith from alternative biometric modalities to extend recognition accuracy or to atone for eventualities wherever a number of the sources can't be determined. The enhancements in performance are proportional to however powerfully the varied modalities are correlate. The external body part yet, doable biometric modalities embrace gait, voice, typewriting vogue, signature and therefore the iris, amongst others. As associate indicator of the present state of multimodal recognition from video, a little choice of recent works that incorporate face sequences with alternative knowledge sources are concisely mentioned below.

Information fusion approaches will either be class-conscious, holistic, or a mixture there from. class-conscious strategies use different algorithms for distinct modalities at different times. The algorithms that execute later use info from algorithms that complete earlier. for example, Chellappa et al. propose the utilization of read invariant gait recognition in eventualities wherever a personal is found removed from the camera. The gait recognition results are wont to slender the search area for a face recognition algorithmic rule that operates once the individual nears the camera. The face recognition method so becomes a lot of economical as fewer face comparisons are needed. Identification may also occur over a wider vary of conditions as a result of the operational ranges of every recognition element offset each other.

Holistic strategies fuse the match scores, selections or knowledge from multiple info supply. Chellappa et al. use score level fusion over the gait and face modalities. Pentland et al. mix recognition and face recognition with a theorem network, whereas Weng et al. introduce the progressive class-conscious discriminating regression (IHDR) tree and use it to map faces and audio clips to identity labels. Xiaodan et al. use a variant of a multiple-instance learning algorithmic rule together with automatic speech recognition to construct face look models.

3.7. Temporal feature aging

Security and police work systems that compare video sequences noninheritable over long periods can naturally get pleasure from biometric characteristics that are invariant to age. the choice of change the gallery on a daily basis will need a big variety of man hours over time. This fact, amongst several others, has driven analysis on face aging. analysis on aging and its effects on face recognition from video are neglected despite the growing interest in face aging. a large number of queries stay unaddressed during this area:

How and to what extent do the ways in which during which individuals confirm expressions amendment as they age?

Do some facial regions move in ways in which are easier to acknowledge over time relative to alternative regions?

Are abstraction options a lot of strong to aging than temporal features?

Can automatic spatiotemporal feature aging be performed to mitigate the consequences stemming from age differences?

Conversely, do temporal options capture info which may be wont to predict the age of a person?

What styles of movement ought to be captured in video datasets to check hypotheses concerning aging?

The interaction between facial dynamics and aging effects presents a chic sort of open issues.

3.8. distributed illustration

Recent developments within the theory of compressive sensing associated distributed illustration have compete an more and more massive role in several analysis disciplines, together with face recognition. Compressive sensing may be a reconstruction technique for generating a sign like a face pattern from associate over complete basis. The underlying assumption is that the foremost helpful reconstruction is distributed in this it ought to solely rely upon a little variety of basis vectors and therefore the corresponding constant vector ought to mostly encompass values close to zero. within the case of face recognition, a fresh determined face pattern is reconstructed employing a linear combination of the training patterns. This downside is mostly underdetermined as a result of the spatiality of the input file generally exceeds the scale of the training set, i.e. the pattern may be reconstructed with multiple constant vectors. However, a sufficiently distributed constant vector will succinctly represent the check pattern and customarily has nonzero entries for the training patterns of 1 category. Such a constant vector so indicates the category of the check pattern. The classification downside is consequently reduced to the matter of computing a sufficiently distributed constant vector, which may be solved in polynomial time with relevance the amount of training samples employing a sort of L1-minimization algorithms. The body of labor on distributed illustration techniques for image-based face recognition is growing. Wright et al. propose the face recognition framework mentioned higher than and show that it's strong to noise and occlusion, particularly once the face patterns encompass pel options. Later work by Wagner et al. extends this theme by increasing its hardiness to illumination variations and alignment errors.

3.9. The spatiotemporal trade-off

The sequence-based approach exploits the temporal continuity inherent to videos and then handles degraded viewing conditions well. Hadid and Pietikäinen gift alittle scale comparison of straightforward set-based algorithms to fashionable spatiotemporal algorithms on low resolution face images. 2 set-based strategies that mix add fusion with PCA and LDA matchers were evaluated aboard the ARMA and HMM spatiotemporal algorithms on the CMU MoBo dataset



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REFERENCES

- [1]. Kenneth R. Castleman "Digital Image Processing". Prentice Hall.
- [2]. A. Blaser, "Database Techniques for Pictorial Applications", Lecture Notes in Computer Science, Vol.81, Springer Verlag GmbH
- [3]. Ryszard S. Chora's (2007) "Image Feature Extraction Techniques and their Applications for CBIR and Biometrics Systems" International journal of biology and biomedical engineering Issue 1, Vol. 1.
- [4]. Chih-Fong Tsai, Ken McGarry, John Tait (2003) "Image Classification Using Hybrid Neural Networks" SIGIR'03, Toronto, Canada ACM 1-58113-646-3/03/0007.
- [5]. Patheja P.S., Wao Akhilesh A. and Maurya Jay Prakash (2012) "An Enhanced Approach for Content Based Image Retrieval" Research Journal of Recent Sciences ISSN 2277 - 2502 Vol. 1 (ISC-2011), 415-418.
- [6]. M. Stricker, and M. Orengo, (1995) "Similarity of color images," SPIE Storage and Retrieval for Image and Video Databases III, vol. 2185, pp.381-392.
- [7]. J. Huang, et al., (1997) "Image indexing using color correlogram," IEEE Int. Conf. on Computer Vision and Pattern Recognition, pp. 762-768, Puerto Rico.
- [8]. Fazal Malik, Baharum Baharudin (2013) "Analysis of distance metrics in content-based image retrieval using statistical quantized histogram texture features in the DCT domain", Journal of King Saud University – Computer and Information Sciences Vol 25 .pp.207 -218.
- [9]. Manimala Singha and K. Hemachandran (2012) "Content based image retrieval using color and texture" Signal & Image Processing : An International Journal (SIPIJ) Vol.3, No.1.
- [10]. MS. R. Janani, Sebhakumar.P (2014) "An Improved CBIR Method Using Color and Texture Properties with Relevance Feedback" International Journal of Innovative Research in Computer and Communication Engineering Vol.2, Special Issue 1.
- [11]. Arvind Nagathan, Manimozhi, Jitendranath Mungara "Content-Based Image Retrieval System Using Feed-Forward Back propagation Neural Network" (2013) International Journal of Computer Science Engineering (IJCSE) ISSN : 2319-7323 Vol. 2 No.04 pp.143-151.
- [12]. B. Darsana and G. Jagajothi (2014) "DICOM Image Retrieval Based on Neural Network Classification" International Journal of Computer Science and Telecommunications Volume 5, Issue 3 ISSN 2047-3338 pp.21-26.
- [13]. K. Arthi, Mr. J. Vijayaraghavan (2013) "Content Based Image Retrieval Algorithm Using Colour Models" International Journal of Advanced Research in Computer and Communication Engineering Vol. 2