

Face Recognition: A Review

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ABSTRACT

Digital pictures are getting additional vital within the transmission information. The external body part is one amongst the foremost vital objects in a picture. Investigation of crime is the situation of human faces then extracting the facial feature in a picture is a very important ability with big selection of applications, like external body part recognition, human pc interfacing. The face detection algorithmic program uses each frontal face and profile face detectors by extracting the 'Haar' options and uses them in a very cascade of boosted classifiers. The set from the face detection algorithmic program that uses a mixture of profile and frontal face cascades and, counting on the create, the face is compared with a specific set of faces having identical vary for classification. The detected faces are recognized by projected them onto the obtained the particular section victimization standard weighted PCA. During this system, create vary is split into 3 bins onto that the faces are sorted. This method has the advantage of recognizing a personal with minimum false positives attributable to create variations.

Keywords:- Face Recognition, Machine Learning, Classification, Genetic algorithm

1. INTRODUCTION

Human face perception is presently a vigorous analysis area inside the computer vision community. Detection the location of human faces therefore extracting the countenance in an exceedingly image could be a vital ability with an honest varies of applications. Face detection is that the essential for part of any face recognition system that locates the face regions from pictures. It additionally has various applications areas like police investigation and security management systems, content-based image retrieval, video conferencing and intelligent human-computer interfaces. Face recognition has been one in every of the for most interesting and important research fields within the past twenty years. Human face perception is presently a vigorous analysis area inside the computer vision community. Detection the location of human faces therefore extracting the countenance in an exceedingly image could be a vital ability with an honest varies of applications. Face recognition is that the strategy of automatically determinant whether or not or not 2 faces unit of measurement constant person. Sort of things produce this troublesome drawback for computers. Faces in footage and video square measure typically captured at varied resolutions, quality, and lighting conditions. Utterly totally different {completely different} cameras have different imaging properties. Moreover, people's facial expressions likewise as their produce with regard to the camera can vary wide, and facial characteristics can modification dramatically as people age over time. Digital footage and video became extra necessary inside the multimedia information era. The face is one in each of the foremost necessary objects in an exceedingly image or video. police work the location of human faces thus extracting the facial feature in an exceedingly image could be a important ability with wide range of applications, like face recognition, police investigation systems, human portable computer interfacing, video-conferencing etc. In this work, it's enforced a personality's face recognition technique by Genetic algorithmic program [2]. Genetic algorithmic programs area unit a random search algorithm that uses chance to guide the search. It will notice the close to world best resolution in an exceedingly giant resolution area quickly. It's been used extensively in several application areas, like image process, pattern recognition, face detection, feature choice, and machine learning. Its power comes from its ability to mix sensible items from totally different resolutions and assemble them into one super solution. Our aim, that we have a tendency to believe to get reached, was to develop a way of face recognition that's quick, robust, fairly straightforward and correct with a comparatively straightforward to grasp algorithms and techniques. Given a picture, the goal of face sight ion algorithmic program is to detect the face and extract the options from given image and to acknowledge the detected face with given info of face pictures that is trained by artificial Neural Network victimization Genetic algorithmic program [3,4,5].

2.LITERATURE SURVEY

There are a unit numerous approaches projected by numerous researchers for image based mostly face recognition. during this chapter a quick description of those approaches and a comparison between them area unit given:

Support Vector Machine

In 1997, Osuna, Freund, and Girosi [6] have recently investigated face detection victimisation framework. However, they use a "support vector machine" to classify pictures, instead of a clustering-based technique or a neural network. The support vector machine encompasses a range offascinating properties, together with the actual fact that it makes the boundary between face and non-face pictures additional specific. The results of their system, the accuracy is currently slightly poorer.

Evolution. Pursuit Approach

In 2000, biological process Pursuit (EP), a completely unique accommodative illustration technique, and showed its practicability for the face recognition downside. EP seeks to find out associate optimum basis for the twin purpose of knowledge compression and pattern classification. Face projections appropriate for compact and economical face encryption in terms of each gift and future recognition ability. The prediction risk, enclosed as a penalty, may be a live of generalization ability and is driven by scatter index. The scatter index is conceptually similar to the capability of classifier and its use is to stop overfitting. Overall, EP provides a new methodology for each useful approximation and pattern classification issues with some prediction risk [7].

Eigen face-based Recognition Approach

In 2001, Kwok-Wai Wong, Kin-Man Lam proposed a additional reliable face detection approach supported the genetic formula and Eigen face technique [8]. Firstly, potential eye candidates are obtained by sleuthing the vale points. based mostly on a try of eye candidates, potential face regions area unit generated by genetic formula. every of the possible face candidates is normalized by approximating the baking angle attributable to head movement. The lighting impact is reduced by reworking their bar graphs into the histogram of reference face image. The fitness price of face candidate is calculated by jutting it onto the eigen faces. Selected face candidates are then additional verified by mensuration their symmetries and determining the existence of various countenance .however limitation is that the edge price for single-face detection is larger than that for multiple-faces detection. Detection rate for multiple faces is poor. Conjointly there's alternative analysis on eigen space-based face recognition [9].

Hausdorff Distance Approach

In 2001, a face detection system that works with edge options of grayscale pictures and therefore the modified Hausdorff Distance. when detection of facial region, face position parameters area unit refined in a very second section. System performance has been examined on 2 massive check sets by comparing eye positions calculable by the system against manually set ones with a relative error live that's freelance of each the dimension of input images and the size of faces. the great localization results show that system is robust against different background conditions and ever-changin gillumination. however there area unit restrictions of detection of solely frontal views and single faces, on automatic model creation and transformation parameter improvement [10]. In 2002, Meng, Shiqian Wu, and Juwei Lu projected a way Radial Basis operate of Neural Network. a general style approach victimisation associate RBF neural classifier for face recognition to deal with tiny coaching sets of high-dimensional problem is bestowed. Firstly, face options area unit 1st extracted by the PCA, then the ensuing options area unit additional projected into the Fisher's optimum topological space during which quantitative relation of the between-class scatter and within-class scatter is maximized. coaching knowledge data is employed in the choice of structure and parameters of RBF neural networks before learning takes place, is bestowed. Finally, hybrid learning algorithm is projected to coach the RBF neural networks. Simulation results show that the system achieves glorious performance each in terms of error rates of classification and learning efficiency. This experiments show that if the variance of noise is little, there's no impact on generalization, whereas massive variance of noise can deteriorate the performance[11].

Independent part Analysis Approach

In 2003, Chengjun Liu associated Harry Wechsler introduced an freelance physicist options (IGF) technique for face recognition. The IGF technique derives 1st a physicist feature vector based mostly upon a group of down sampled Gabor moving ridge representations of face pictures by incorporating completely different orientation and scale native options. freelance part analysis operates then on the physicist feature vector, who sedimensionality has been reduced by PCA, and derives freelance physicist options. Finally, the in dependence property of freelance physicist options ends up in associate application of the PRM method for classification. On one hand, physicist reworked facepictures exhibit robust characteristics of spatial neighborhood, scale and orientation property, the same as those displayed by physicist wavelets. It produces salient native options in neighborhood of the eyes, nose and mouth that area unit most fitted for face recognition. On the opposite hand, ICA would additional sight redundant options. The IGF technique facilitates automatic implementations a result of it doesn't involve non-trivial manual annotation of form points[12]. In 2006, Linlin Shen and Li Tibeto-Burman introduced a review on physicist wavelets for face recognition [13]. second physicist wavelets introduced that the way to use them for native feature extraction. In face recognition, Face image might be pictured by the physicist jets extracted at some pre-defined feature points. Analytical ways utilize the physicist jets

extracted from pre-defined feature points on the face pictures for recognition. Completely different approaches to find feature points for physicist jets extraction, classified into 2 categories: For elastic graph based mostly analytic methods, a graph is 1st placed at associate initial location and misshapen victimisation jets to optimize its similarity with a model graph. Non-graph based mostly ways find feature points manually or by color or edge etc. then recognition will then be performed victimisation physicist jets extracted from those feature points. however additional analysis work is needed in the following areas: 1) the way too point for the optimum physicist moving ridge basis. While most of the works area unit following the framework of 5 scales/eight orientations, a large number of works conjointly projected their own style ways. However, most of the ways area unit bestowed while not justification and it remains unclear that one is that the best.2) With no assumptions on locations and parameters of physicist moving ridge basis, associate improvement algorithm able to pick out each the physicist moving ridge basis and jet locations for face illustration is needed. 3) The graph structures accessible for representation of faces area unit comparatively restricted, new structure and graph matching algorithms area unit inspired.4) the eye on physicist moving ridge networks is truly quite restricted.[13].

3. CONCLUSION AND FUTURE SCOPE

Face recognition may be a difficult drawback within the field of image analysis and pc vision that has received a great deal of attention over the previous few years attributable to its many applications in numerous domains. analysis has been conducted smartly during this space for the past four decades or so, and although Brob dingnagian progress has been created, encouraging results are obtained and current face recognition systems have reached a particular degree of maturity once in operation beneath unnatural conditions.

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