

Survey on Design of Deep Learning Algorithm for Application by Image based Face Recognition

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Abstract: For recognizing the face of any person, the most prime feature is the face, face recognition method is the best method for recognizing an individual than any other biometric methods. In face recognition, system can identify a person from video or image but in this proposed system, the face is identified only from real-time images. The process for authenticating face is partitioned into two steps, first step is to detect face using Haar Cascade algorithm which is a machine learning object detection algorithm, it does object detection using haar feature based cascade classifiers which is an effective object detection method purposed by Paul Viola & Michael Jones. The second step is to recognize an individual's face using LBPH (Local Binary Patterns Histogram) algorithm. The main purpose of this research is to recognize and detect an individual's face in real-time camera-based image capturing.

Keywords: LBPH (Local Binary Pattern Histogram) Algorithm, Haar Cascade Algorithm.

I. INTRODUCTION

Biometric authentication is immensely popular these days because it is a very good way of authenticating someone providing access control, detecting fraud, and identifying criminals and this is possible because it utilizes what makes a person unique like their DNA, their fingerprint it is for the face. Face detection and recognition in biometrics have become immensely relevant these days because of how easy it is to use and implement. All you need is just a high-quality camera and a good algorithm. Both of these things can be easily installed on any system. In this paper, implementation of face detection and recognition is done. Some common face recognition algorithms are Eigenface which uses principal component analysis and Fisherfaces which is an improvement over eigenface and then another method is LBPH (Local Binary Pattern Histogram) which is used in this project, this is very different from the first two algorithms because it doesn't look at the training image as a whole instead it chooses to look at individual part of each and early image, so it looks at every single pixel throughout the image and it focuses on the central pixel in one spot and it then compares itself to the neighboring pixels and it considers the result as a binary number and converts it in a histogram. Another classifier that used is the Haar cascade classifier, so Haar Cascade is essentially an ML based approach where a cascade function is trained from a lot of positive and negative images. It is used to detect an object in other images, so this essentially has features like the Haar feature selection creating integral images and cascading classifiers. Face recognition system have a lot of applications. Well-planned face recognition can help in various sectors like authentication system, recognizing a person's individuality, security system, information security, smart cards, education, healthcare, and many more.

II. LITERATURE SURVEY

There are different approaches towards safety through facial recognition. LBP was introduced by Ojala. This method describes and defines the texture and shape of a digital image. LBPH is a Local Binary Patterns Histogram is used for facial recognition. LBPH is a combination of LBP and Histograms of oriented gradients descriptors. Machine learning Algorithms helps to make facial security authentication system. ML is a subpart of Artificial Intelligence.

Local Binary Pattern Histogram is used to extract features and likewise, many algorithms can be used in ML. Facial recognition will help interact with robots in human machine interaction. It also tells us about how an individual's skin colour is picked and converted to binary for further process. Haar Cascade classifier is an ML object detection program.

Various Machine learning algorithms like LBPH (Local binary pattern Histogram), PCA combined with KNN, support vector machines, and linear discriminate analysis for face recognition system. The program flow starts from face detection, feature extraction, and face recognition using LBPH.

III. EXISTING SYTEM/OPEN ISSUES

The use of a surveillance system for image detection is becoming more important. An embedded surveillance system is frequently used in the home, office or factory for image processing of the surveillance system and also for traffic monitoring but this configuration requires a high performance core, which works against some advantages of embedded systems, such as low power consumption and low cost. Some designs propose the use of different sensors to track the sequence of the human body movement

Negative comments

Depends on Wi-Fi strength: The biggest disadvantage of a wireless camera system is that it is completely dependent on the strength of your Wi-Fi connection. Any interruption or weak signal can mean that you may lose connection to the system, resulting in the loss of the film, which can be critical.

IV. CONCLUSION

In this paper, we have implemented face detection and face recognition using the haar cascade algorithm and LBPH algorithm respectively. Our algorithm successfully detects and recognizes a face from real-time camera-based images. We have implemented this algorithm on so many real-time images and found that it effectively detects and recognizes faces with different facial expressions. As machine learning is very crucial these days, there are so many sectors where this work can be elongated.

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