SYSTEM AND METHOD FOR HUMAN FACE DETECTION

Mr Bisahu Ram Sahu, Dept. of Information Technology

Dr. C.V. Raman University, Bilaspur

Abstract

The proposed system for human face detection, comprising: an image capturing module for capturing multiple images of the person, a face recognition unit, a prediction module, and a human face detection method, comprising the steps of; capturing the images of the person, converting them to grey scale images, subjecting images to face detection process, subjecting to a face recognition process, dividing face images into blocks, calculating histogram for each blocks and combining them to obtain processed face image, capturing real time images and subjecting to the face detection and face identification process, and determining age and gender of the person by comparing the images using protocol.

Keywords: human face, prediction module, training module, image capturing unit.

1. Introduction

Face is considered as one of the most important biological characteristics of a human, responsible for reflecting many of the biological information of the human, such as identity of a person, age, ethnicity, expression and so on. Because of their uniqueness and non-contact, it cannot be copied as each and every individual is having different facial features. Even twin babies from same parents are also having different facial features. Currently face recognition technology is used for determining the identity of the person, it is having potential application in information security, public security and many more. With the rapid development in artificial intelligence and image processing, the face detection technology is employed to identify the real time face of the person and later recognize the same by comparing the real time facial images with the stored images. Basically, the human face detection system are fabricated to extract out the facial features of the person, such as eyes, expression etc. Initially the real time images of the person are captured, later the captured images are subjected to pre-processing technique to remove the unwanted objects from the images and later the processed images are subjected to face detection and face recognition process and later the obtained facial images are compared with the stored images to determine the facial features of the person. It does not helps to determine the gender of the person and also not able to generate the unique identity of the person. In

order to minimize aforementioned limitations there is need to develop a system that determines the gender of the person and improves the robustness and accuracy of face recognition.

2. Experiment

The human face detection system and method, for automatically detecting and tracking a human face by capturing the real time images and later differentiating the same with previously stored images to get the information about the gender and age of the person.

The image capturing module is installed in the system that captures the multiple images of the person [1]. The image capturing unit used is preferably a camera. The face detection module is connected to the pre-processing unit that locates the person face in the pre-processed images [2][3][4]. The HAAR feature is having some value which can be determined by adding value of area of each rectangle. The area of the rectangle is basically calculated by using integral area concept [5]. The feature extraction module is attached to the face detection module that extracts the person facial features, such as face expression, eyes closed or open, and men or women face from the images [6]. Once the system is trained, the YML file is generated which stores the information of the trained system [7]. The face recognition unit is connected to the feature extraction module that compares real time images with the previously stored images [8]. The face recognition is preferably carried out by using LBPH protocol. The database module is connected to the prediction module that stores the pre-processed images, face detected images, face recognition images, and trained images. The method comprising the steps of; a) firstly, the multiple images of the person are captured using a camera, the obtained image of the person is subjected to pre-processing treatment so as to eliminate unwanted objects from the captured images and later the pre-processed images are stored in the database module, c) the captured images are subjected to a face detection process using voila jones protocol, d) few stored images are extracted from the database module to provide the training to the system, e) then extracted images are subjected to a face recognition process, f) the obtained face images are divided into blocks and histogram for the each image is determined and later the obtained histograms are combined to obtain a single histogram in order to obtain processed face images, g) later the real time images are captured, later they are subjected to a face detection and face identification process and then they are compared with the already stored images, if the real time images are not successfully matched with the stored

images then the images are subjected to age and gender detection process using a protocol, on other hand if the real time images are successfully matched with the stored images then the age and gender of the person is calculated using the protocol.

3. Result and conclusion

The system is designed to analyze the facial features, such as age and gender of the person by differentiating the real time facial images of the person with the previously stored images. The Raspberry Pi based camera is used to capture the images of the person. The LBPH protocol is used here for the extraction because of its ease of use and simplicity.

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