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Automatic Attendance Using Face Recognition

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ABSTRACT: Image inpainting is the process of restoring the lost or damaged regions or modifying the image contents imperceptibly. It refers to the process of filling-in missing data in a designated region of the visual input. In this paper, the technique presented is for detection and removal of text from images. The system detects text using morphological operations, connected component labelling and a set of selection criteria which helps to filter out non-text regions. So, the resultant image is the image with only texts. Text Inpainting is done in two steps. The first step detects the text region automatically, without user interaction and in the second step; the text is removed from the image using exemplar based Inpainting algorithm.

KEYWORDS: Text detection, Inpainting, Morphological operations, Connected component labelling.

I. INTRODUCTION

In addition, the attendance considered as the biggest issues that may face lecturers in class. It takes time, effort and difficult to manage. Therefore, our project will focus on online student attendance. In another word, the aim of this project is to build a system that help lecturers take student's attendance in a professional way. Over the past decade, taking down student's attendance process had been developed and changed. The driven force of this development is the desire to automate, facilitate, speed up and save time and efforts. Although that the attendance systems are around us everywhere, lecturers still use a traditional way to record student's attendance either through calling out student's names or through a passing attendance sheet among students to sign beside their names. Both ways are time consuming and associated with high error scales. In this project, we attempt to reduce wasted time, eliminate buddy clocking, and automate the process. Our system uses facial recognition technology to record the attendance through a high-resolution digital camera that detects and recognizes faces and compare the recognize faces with student's faces images stored in faces database. Once the recognized face matches a stored image, attendance is marked in attendance database for that person. The process will repeat if there are missed faces. For example, if there are 4 faces missed for a bad position while the detecting phase, then this phase will start again to detect the missed faces and recognize them and continue the attending process. By the end of the month, a monthly report is sent to the lecturer contains attendance and absence rates as a chart and the names of absentees. In this chapter, we present a brief overview of face recognition in the background section, relevant works to our project with their advantages and disadvantages, how we relate to these studies and how this project can provide some beneficial features for lecturer.

Paper is organized as follows. Section II describes automatic text detection using morphological operations, connected component analysis and set of selection or rejection criteria. The flow diagram represents the step of the algorithm. After detection of text, how text region is filled using an Inpainting technique that is given in Section III. Section IV presents experimental results showing results of images tested. Finally, Section V presents conclusion.

II. RELATED WORK

Most lecturers have a significant number of students and it is hard to keep taking or tracking all their absence. Facial recognition is commonly used in many institutions to take attendance of a significant number of students. There are many errors that could occur during this process, including misidentification and self-recognition. Lecturer can control

the errors and correct it. Many works related to Radio Frequency Identification (RFID) based Attendance Systems exist in the literature. In RFID [1] based system, students carry a RFID tag type ID card and they need to place that on the card reader to record their attendance. RS232 is used to connect the system to the computer and save the recorded attendance from the database. This system may give rise to the problem of fraudulent access. Unauthorized person may make use of authorized ID card and enter the organization. Finger print based Attendance System has a portable fingerprint device which can be passed among the students to place their finger on the sensor during the lecture time without the instructor's intervention. This system guarantees a fool-proof method for marking the attendance. The problem with this approach is that passing of the device during the lecture time may distract the attention of the students. Face detection is a basic technology of human-computer interaction. It can get information from the faces in pictures. Face recognition technology analyses the face image to extract the facial feature, and then identify specific target.

The work in this project is divided into 4 parts (1) Face Detection: Face Detection Histogram of Oriented Gradients Method(HOG Algorithm) In this method images converted into a black and white image. Then every pixel of image is compared to its surrounding pixels and arrows are drawn in a direction in which image is getting darker. When the process is repeated for every single pixel of the image, the pixels are replaced by arrows called and gradients. These gradients show the flow from light to dark across entire image. Then to find faces in a HOG image the algorithm compares parts of this image with different HOG patterns. (2) Analyse Facial Features: Posing and Projecting Faces After faces are detected the problem is faces turned in different directions look totally different to a computer. To solve this issue, the image is wrapped so that eyes and lips are always in same place in every image. To do this, face landmark estimation algorithm is used. This algorithm finds 68 specific points of the image called landmarks. Now after finding location of eyes and lips, the image is simply rotated to a perfectly cantered face image. For this process, Affine transformation is used. (3) Encoding Faces: 128 Embeddings (Measurements) In this method 128 measurements (Embeddings) are generated for each face using trained deep convolution neural network. In this method, the complicated raw data (picture) is reduced to a list of computer-generated numbers. The process of training a CNN to output this embedding requires a lot of data and computational power. Even with an expensive video card it would take days of continuous training to get good accuracy. But this process is already done by OpenFace and it is open for all to use. So, we just have to run our image through pre-trained network to find embeddings. These 128 embeddings are representation of 128-Dimensional unit hypersphere. (4) Face Recognition: Comparing faces with known encodings Now, we have encodings of all faces from image also a database of known people. We just have to find the closest known image from image database for each face detected. We can do that with basic machine learning classification algorithms. We will use a simple scalable vector machine (SVM) classifier. Other classification algorithms also can work. We have to train classifier that can take measurement from new image and tell which known person is closest match. Running this classifier takes milliseconds.

III. METHODOLOGY

Algorithm for generating of attendance after registering students and uploading a image as:

1. Get the list of student's images/encoding from database.
2. Train model using retrieved data.
3. Find faces present in uploaded images.
4. Encode all detected faces.
5. Generate result for every face with trained model.
6. Generate list of present students.
7. Mark attendance of present students in database.

IV. EXPERIMENTAL RESULTS

1. Input image uploaded by user



Fig 1: .Input image

2. Output Faces Detected by System



Fig2: Output Image

3. Generated Attendance

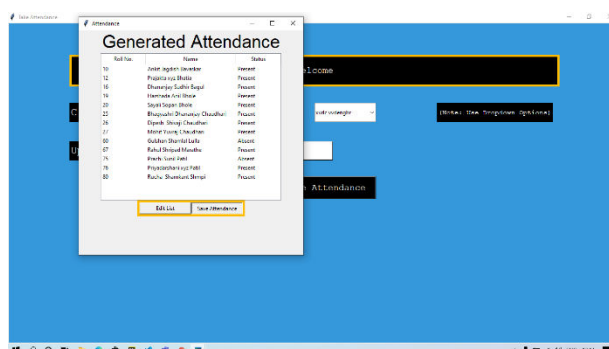


Fig 3. Generated Attendance

IV. CONCLUSION

. The proposed approach provides a method to identify the individuals by comparing their input image obtained from recording video frame with respect to train image. Attendance of the student are marked using the recognized face of every individual student and the data is stored in an attendance sheet. The attendance of every student marked



automatically by recognizing their face with the face present in the data base. Teacher can manage the attendance of student if any student faces is not recognized properly.

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