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AUTOMATIC DOCUMENT VALIDATION

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Abstract: Every year lakhs of trainees take entrance and annual exams under various schemes under DGT like CTS, CITS etc. These trainees are generally from poor background with below average skills to use computer system. It is found that in many admit cards generated , in place of photo , by mistake they upload their signature and thus they get a faulty admit card. A system may be developed using automatic analysis of uploaded documents to upload and place after AI correct documents at right place in the portal so that this problem of faulty admit cards may be completely resolved. This system detects what is being uploaded whether the Signature or Photo from the uploaded documents for the Admissions or for the Scholarships. It alerts the students to upload the documents in correct order as mentioned.

Index Terms – Signature verification, Face Detection, Haar Cascade Classifier

I. INTRODUCTION

Over the past several years, the quantity of data mainly images that are getting uploaded to the Internet has grown at a large rate. This recent growth in data has encouraged computer scientists to solve problems in computer vision. The Signature is broadly utilized as a method for individual distinguishing proof apparatus for people necessitates. Signature verification and forgery detection is the process of verifying signatures automatically and instantly to determine whether the signature is real or not.

There are two main kinds of signature verification: static and dynamic. Static, or off-line verification is the process of verifying a document signature after it has been made, while dynamic or on-line verification takes place as a person creates his/her signature on a digital tablet or a similar device. The signature in question is then compared to previous samples of that person's signature, which set up the database. In the case handwritten signature on a document, the computer needs the samples to be scanned for investigation, whereas a digital signature which is already stored in a data format can be used for signature verification.

Handwritten signature is one of the most generally accepted personal attributes for verification with identity whether it may for banking or business. Confirmation of signature can be performed either Offline or Online dependent on the application. Anyway, human signatures can be dealt with an image and perceived by utilizing computer vision and neural network methods. Face-detection functionality detects whether faces exist and the coordinates of those in photos. This is not the same as facial-recognition technology, which refers to the ability to recognize which specific people are shown in a photo. Feature-based methods try to find invariant features of faces for detection. The underlying idea is based on the observations that human vision can effortlessly detect faces in different poses and lighting conditions, so there must be properties or features which are consistent despite those variabilities.

A wide range of methods has been proposed to detect facial features to then infer the presence of a face. While Cloudinary does not provide built-in facial-recognition features, you can combine Cloudinary functionality with other AI technologies to address face recognition needs. Researches on this technology are ongoing and have a very broad scope. Its applications have high potential which can make an impact on society. For predicting anything we need to

train our model with sample data. The difficulty lies in the nature of the sample data that is needed to train these types of systems. In this era of the internet for general object classification tasks we often have access to millions of images. We are using Haar cascade classifier to recognize the faces.

II. LITERATURE SURVEY

For online applications photo and signature upload is mandatory. If the photo and signature are not uploaded at respective positions leads to faulty admit cards, in turn it leads to application rejection. So, during the application submission only it should be solved. To achieve this during for photo upload face detection in the uploaded photo and signature detection in the uploaded signature image has to be detected before the application submission. For detection of face and signature in the images several methods are proposed.

In [1] proposed facial signature for identification, verification, and authentication of persons. Recent migration to biometric technologies in most applications increases interest in monitoring people. These include fingerprint-, iris-, face-, and verification-based control systems. Face recognition is important because autonomous systems don't require user interaction. Face representation is crucial for reliable face recognition. Variable intra and inter-face characteristics make this difficult. Consider a 3-D matrix representing a face to illustrate the difficulty. One face rotation changes the matrix representation. Face representation requires an invariant description after rotation, translation, illumination, etc. The first was fractal representation. This method uses the theory that an object can be represented by auto similar elements. It used fewer computational resources than traditional PCA, but a new sample required recalculating feature vectors. Many other representations are based on converting a (usually 3-D) matrix to a 1-D feature vector. This reduces CPU usage. Most of these representations assume a high-resolution image that can't be spoofed. To address these issues proposed FaSIVA (Face Signature for Identification, Verification, and Authentication) a robust face representation that handles identification, image enhancement, verification, and authentication.

In [2] proposed a method of face detection based on deep learning, which called Deep Dense Face Detector (DDFD). The method does not require pose/landmark annotation and is able to detect faces in a wide range of orientation using a single model. In addition, DDFD is independent of common modules in recent deep learning object detection methods such as bounding-box regression, SVM, or image segmentation.

In [3] proposed handwritten signature verification using Deep Learning .The handwritten signature is a behavioural biometric which is not based on any physiology characteristics of the individual signature but on the behaviour that change over time. Since an individual's signature alters over time the verification and authentication for the signature may take a long period which includes the errors to be higher in some cases. Inconsistent signature leads to higher false rejection rates for an individual· who did not sign in a consistent way.

In [4] proposed a method of handwritten signature verification using neural network approach. The method uses features extracted from pre-processed signature images. The extracted features are used to train a neural network using error back propagation training algorithm. The network could classify all genuine and forged signatures correctly. In [5] proposed Robust Real-Time Face Detection, an efficient classifier built from computationally efficient features using AdaBoost for feature selection for detecting the face from the image.

In [6] Face detection is a mature problem in computer vision. While diverse high performing face detectors have been proposed in the past, we present two surprising new top performance results. First, we show that a properly trained vanilla DPM reaches top performance, improving over commercial and research systems. Second, we show that a detector based on rigid templates - similar in structure to the Viola & Jones detector - can reach similar top performance on this task. Importantly, we discuss issues with existing evaluation benchmark and propose an improved procedure.

In [7] proposed model for signature verification. Handwritten signature verifications are online and offline. Online method uses electronic technique and a computer to extract information about a signature and takes dynamic information like pressure, velocity, writing speed, etc. for verification. Off-line signature verification uses signature

images captured by scanner or camera. An off-line signature verification system uses scanned signature features. Features used for offline signature verification are simpler. In this, only the pixel image needs to be evaluated. Offline systems are difficult to design because many desirable characteristics such as stroke order, velocity, and other dynamic information are not available. The verification process relies solely on the features extracted from static signature images. In Handwritten Signature Verification (HSV), especially offline HSV, different technologies have been used and the area is being explored. In [8] proposed a method for face detection using Histograms of Oriented Gradients (HoG) features and AdaBoost for feature selection to achieve a fast and accurate human detection system.

III. METHODOLOGY

The proposed method detects photos and signatures in uploaded images. Face detection can be done in 3 different methods: holistic method, hybrid method and feature extraction method. Feature extraction method detects the face by extracts the features like eyes, nose, ears etc. Signature detection can be done by recognizing the text in given documents. If the text is detected then it will be confirmed as the signature.

After the user uploads the document it finds out the document position and if they are placed in wrong positions then it displays an alert message and lets the user to upload document correctly by using reset button provided. If they uploaded correctly then form can be submitted by clicking the submit button provided.

The following figure 1 shows the flow of the proposed system.

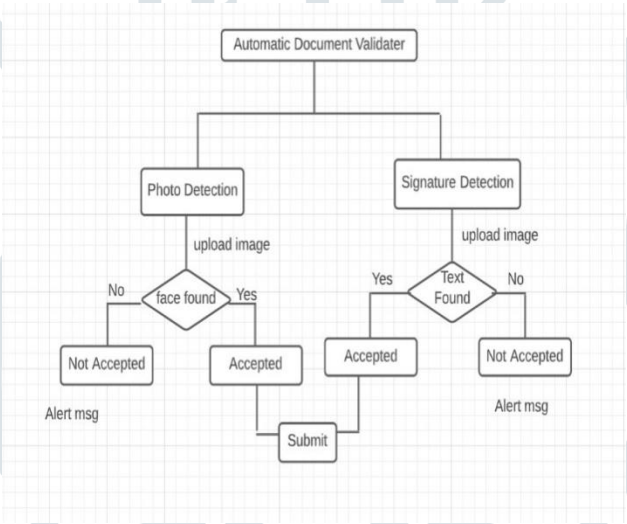

Fig: 1 Proposed System flow diagram

When the application is executed it popup a window that asks the user to upload a photo and signature. After the user uploads the document it finds out the document position and if they are placed in wrong positions then it displays an alert message and lets the user to upload document correctly by using reset button provided. If the documents are uploaded correctly then form can be submitted by clicking the submit button provided.

MODULES:

Signature detection:

In order to detect the signature, we are using different modules from signature_detect from python, a simple tool to detect if there are **signatures** in **an image** or **a PDF file**. It contains 4 classes.

1) The first one is signature loader, Loader can read an image or a PDF file page by page. It returns a list of the masks. Each mask is a numpy 2 dimensions array. Its element value is 0 to 255.

2) The second one is extractor, Extractor reads a mask, labels the regions in the mask, and removes both small and big regions. We consider that the signature is a region of middle size.

3) The third one is cropper which is used to crop the regions in the labelled mask.

4) The fourth one is judger. Judger decides whether a region is a signature. It judges whether a region contains a signature based on the ratio of its height and width and the ratio of pixels.

Photo detection:

Haar cascade is an object Detection algorithm used to identify faces in an image or a real time video. The algorithm uses edge or line detection features proposed by Viola and Jones in their research paper "Rapid Object Detection using a Boosted Cascade of Simple Features" published in 2001. The algorithm is given a lot of positive images consisting of faces, and a lot of negative images not consisting of any face to train on them.

The repository has the models stored in XML files, and can be read with the OpenCV methods. These include models for face detection, eye detection, upper body and lower body detection, license plate detection etc. Below we see some of the concepts proposed by Viola and Jones in their research.

The original implementation is used to detect the frontal face and its features like Eyes, Nose, and Mouth. However, there pre-trained HAAR cascade classifier available in the Github for other objects as well like for full body, upper body, lower body, smile, and many more will have an impact on the methods we perform on real-world images on social media.

IV. RESULT

The following figure. 2 shows the application window where the user must upload documents.

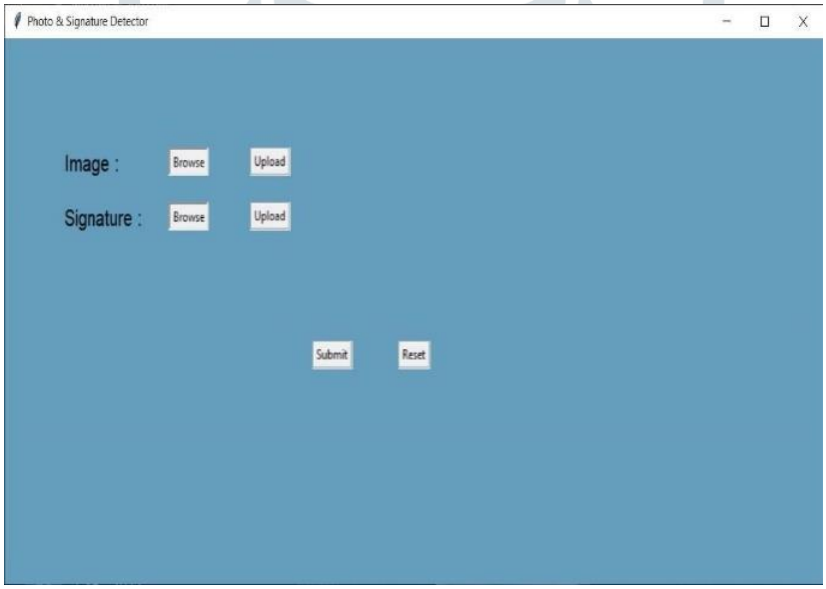

Fig 2: Application window

V.CONCLUSION

Automatic document analysis fixes faulty admit cards. The admit card issue is resolved, and trainees will be trained properly. Because trainees lack computer experience, we used face and text detection to upload documents correctly. Face and signature detection alerts users to upload documents correctly. The admit card issue will be resolved, and trainees will be trained.

VI. REFERENCES

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