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Fraud Detection in Examination from Hall Ticket

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Abstract:

I This paper presents a system designed to detect fraud in the hall ticket verification process of offline examinations. The system employs computer vision and machine learning techniques such as Haar Cascade, grayscale conversion, feature extraction, and cascade classifiers to automate and enhance the verification process. Through real-time detection, the system ensures that only legitimate candidates gain access to the examination hall, thereby reducing potential cheating and impersonation. The methodology includes stages like input acquisition, preprocessing, feature extrac tion, segmentation, and classification, culminating in an accurate result that high lights fraudulent attempts

I. INTRODUCTION

The hall ticket verification system is a state of the art security solution developed to secure and facilitate unique identification andtrack where in few minutes the examination process acrossed The system uses facial recognition, specifically the Haar Cascade Algorithm, to confirm your identity via their laptop or external cameras. The verification starts with students who login and register their identity linked to the hall ticket information. The moment They decide to enter the examination centre. their face is automatically read by the system and compared with pre-registered one database. Once the face is verified, his/her hall ticket details will be displayed on screen ensuring smooth entry for the student. In case, the face does not match with their identity it marks them as an unauthorized person and all exam authorities get informed about a possible breach of peace.

Hall tickets hold a vital place in both online and offline exams, works as identification proof that enables you to take the exam. But drama of fake hall ticket verification is major concern. This challenge exists in the larger document security space and thus, we need to be able to prove ownership of a given document. In scenarios like document image retrieval, hall tickets are the effectively indexing tool that directly helps in arranging a massive amount of student data. By having a large pool of hall tickets, fake entries can be identified which will magnify the accuracy and security of document retrieval, allowing the students only to enter for exams if authentic.

II. LITERATURE SURVEY

Many research work was conducted on the automated systems designed to flag and prevent examination imperfections by evaluating hall tickets using image analysis, biometric systems, and machine learning techniques. These can be useful contributions for fraud-detection frameworks toward more robust, automated verification systems.

Automated Examination Fraud Detection from Hall Ticket by Chithra S Ravi et al., is a system in which hall ticket images are uploaded by invigilators for backend processing. Applying OCR via Pytesseract extracts text data and it invokes face recognition algorithms like DeepFace and FaceNet for confirming the actuality of the student. This system opines that integrating image recognition and text extraction for verification of the actuality of hall tickets is much important.

Hall Ticket Fraud Detection System using ANN Classifier by Prof. Ms. P. P. Deshmukh et al. Application of Artificial Neural Networks for Classification of hall tickets was a

model proposed. It captures the process of pre-processing of hall ticket images through segmentation, face detection, and finally feature extraction where both shape and histogram features were used to achieve an accuracy rate of 94.12%. The paper elaborates on the performance of the ANN classifiers in document image analysis and facial recognition.

A review on Strengthening Exam Integrity: Fraud Detection through Hall-Ticket-Based Measures using Machine Learning by Shrinil S. Makeshwar and Prof. Krutika K. Chhajed focuses on the detection of impersonation and electronic device use in exams by reflection to combat automated surveillance and detection, while keeping in view the societal implications of exam integrity for mental well-being among students.

Trained Automated Attendance Monitoring System by Dr. S. Selvi, Face Recognized Model: It suggests a model for attendance management through face detection and recognition. This paper would be demonstrating the application of biometrics in academic environment, showing how facial recognition-based attendance system also acts like surveillance system, thereby keeping integrity in the exams.

In the paper Mamun Al Md Authentication System for Exam Halls Using Face Biometrics, an authentication system relying on a DCNN algorithm for facial recognition has been discussed. This system acquires several images that are captured by highly resolution cameras in order to reduce mistakes of identification; it increases security with lower risks of impersonation while at the same time making the identification process more efficient. The author focuses on how this DCNN approach brings about improved accuracy in identification.

An Automated Fraud Detection of Hall Ticket in an Offline Examination System Using ANN Classifier by Shridevi Soma and Vidyashree S.A. This offline system utilizes the ANN for feature extraction and classification to detect fraud in a hall ticket. Similar to the previous works, this system involves stages such as preprocessing, segmentation, and feature extraction contributing the same for advancement in the system of offline fraud detection.

Sagar M. Rao et al., Exam Department Fraudulent Detection using OpenCV and Deep Learning with SVM Classification Algorithm for Impersonation, aimed to detect and recognize faces based on OpenCV and deep learning with the SVM classification algorithm for identity verification in educational settings. Using the Helen dataset for training, the study showcased the applicability and effectiveness of SVM combined with image processing techniques for identity verification in educational settings.

Exam Integrity with Detection of Frauds in Exam Centers by Mr. M. Palanisamy et al.: Detection and Prevention of Fraud Activities in Examination Centres Using Python relies on the Convolutional Neural Network and Grassmann Algorithm for the purposes of recognition of face and analysis of the behavior of students. It aims to prevent impersonation, especially in resource-constraining conditions by optimizing recognition processes with deep learning.

The paper Fraud Detection in Examination using LBP Method by Tejashwini S.G. presents a model for face detection and recognition through Local Binary Patterns. These images get converted into arrays, and subsequent classification becomes quite possible against impersonation. The LBP method is notable for its computational simplicity that makes it a preferred method for real-time application

III)METHODOLOGY

The system to be proposed here will detect a fraudulent hall ticket in real-time by processing the input through a series of steps that include capturing images of the hall ticket, preprocessing it, further extracting a feature from the image, then further segmenting it, and classifying it. Each of them was designed to isolate important features about a hall ticket so as to allow authentication for security purposes at an examination hall.

The high-quality camera captures a real-time image of the hall ticket presented by the candidate. Such an image is used as the primary input for detailed information to undertake further steps in analysis and verification. Pre-submission or manipulated images can be prevented at the time of examination with the help of real-time image capture.

The image might be converted into grayscale so that complexity is reduced. Thus, computation time can be

reduced while retaining all necessary details.

Noise Reduction: Noise in an image, which may include background details or unwanted marks is reduced using Gaussian blur or median filter. This processing will ensure that the text will be clearer and more accurate as features for look out for during detection, such as text and facial recognition areas.

The system will extract critical features from the hall ticket, focusing on patterns often used in legitimate tickets:

Haar Features for Pattern Detection: The Haar-like features of the image detect patterns to enable the uniqueness of features such as specific fonts, logos, and QR codes associated with authentic hall tickets. Haar features are used to efficiently recognize the unique characteristic and pattern of features that distinguish the real from the fraud one.

Region Division: The hall ticket image is divided into regions. Using the sliding window approach, the system checks a region at a time through the image. The high priority regions are photo ID region, hall ticket number region, and institution logo.

Region of Interest Detection: This makes the accuracy attached to the detection of some details in the regions increased. The features in each region are compared to the valid ticket features learned early, as a verification process.

Classification: The authenticity of the hall ticket is determined based on features derived or segmented from the image:

A pre-trained cascade classifier, already trained over samples of legitimate hall tickets, classify the arriving images while analyzing patterns, fonts, and structures to determine whether the ticket matches that of the legitimate hall ticket format.

Fraud Detection: When the system detects discrepancies, it flags the hall ticket as a possible fraud. Hall tickets, which do not belong to the authorized patterns or contain identifying traits, are thus marked suspicious and sent for verification.

Outcome Generation and Notification

Based on the classification outcome, the system renders a final verdict on each hall ticket:

Flagging and Notification: Potential fraud flags in hall tickets raise alarm and alert examination invigilators to investigate further. This feature helps to increase prompt detection and possible response times to unauthorized access in the hall.

Valid number hall tickets are authorized to enter and sit for the test. The system decision-making process confirms only the valid entry of such a person who possesses a proper hall ticket, thus making the exam safe

The algorithm for hall ticket recognition is: Set of rules: Hall ticket popularity

input: colour photographs of hall tickets Output: Authentication flag (legal or unauthorized man or woman)

Method: ANN is: Set of rules: Hall ticket popularity

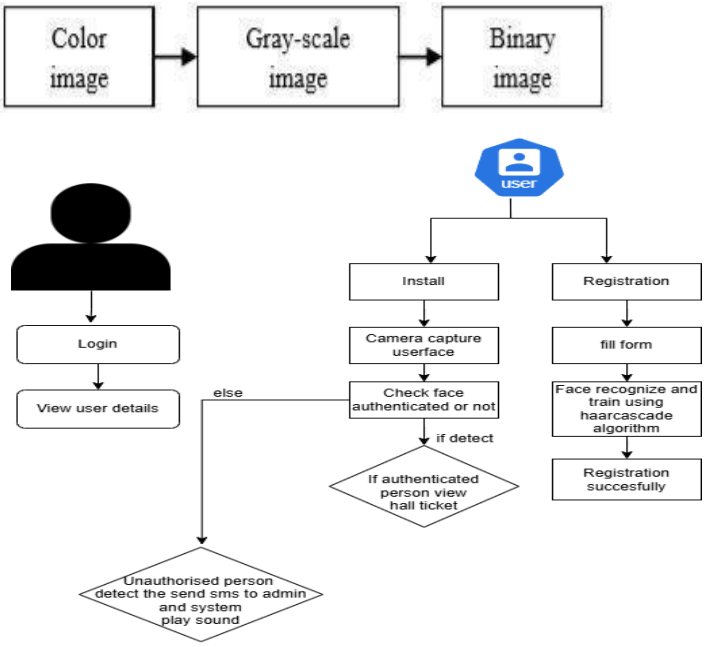

Figure 1: Block diagram of automatic hall ticket reorganization

IV)MODELING AND ANALYSIS

Image Acquisition

The image of the hall ticket is captured in real time by scanning through an HP C4388 series scanner at 300 dpi resolution, producing an image of 3510 x 2550 pixels. The scanned image is then added into the training dataset.The photographs are acquired by way of scanning: Scanning is a way of converting the examination corridor hall ticket file into virtual layout. The exam hall ticket pics are scanned with the aid of the HP picture clever C4388 series scanner. The photographs are scanned at 300 dpi decisions which generate a picture of 3510 X 2550 pixels and are introduced to educate dataset.

Preprocessing: Organization of further analysis proceeds using the resized and binarized images. Resizing involves focus on changing the dimensions of the images, while binarization transforms them from colored or gray to the binary format for the efficient extraction of features.

Segmentation: Identify individual elements of the hall ticket image, including the candidate's name, seat number, and photographs. Noise reduction is implemented with morphological operations through controlled dilation in both the horizontal and vertical directions in order to separate each component. Saved to a database are segments of each type.

Face Detection: For face detection, an intermediate system has been developed that was carried out using an ad-boosting algorithm to develop a very high accuracy classifier. The systems use Haar-like features for image processing, notably two-rectangle, three-rectangle, and four-rectangle features which allow easy and quick detection.

Feature Extraction: The image of the hall ticket has important characteristics concerning shape as well as texture, which can be correctly verified. In the process, 10 shape features that calculate properties such as area, perimeter, form factor, major and minor axes and roundness and density have been computed and stored as feature vectors. Unauthorized Access Detection: If an unauthorized person tries to enter the examination hall, the system initiates extra security checks. The system sends an alert email to the coordinator automatically. In addition to this, a buzzer rings nearby to alert the near-by supervisors and staffs. This two-step alarm mechanism makes real-time security more robust and helps to respond quickly to possible or potential unauthorized entries

V)CONCLUSIONS

This system offers a safe method for examination hall ticket fraud detection-offline, through real-time image processing. Scanned high-resolution images of the hall ticket are prefaced and segmented to recognize the essential information: name, seat number, and photo, as available in the database. Face detection is solved using an adaptive boosting algorithm combined with Haar-like features, providing rapid and accurate identification. Unauthorized entries raise an alarm and e-mail this information to the exam co-coordinator and activate a buzzer. There is further potential for deep learning, increased datasets related to recognition of different forgery types, adaptation for varying lighting and hall ticket formats, etc.

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