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Exam Hall Authentication System Using Conventional Neural Network

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ABSTRACT -During examinations, Authentication has always been the major challenge. Hall ticket and identity cards are normally used in the examination system for fraud detection. Existing examination system mainly deals with document image analysis techniques and biometric system in identification, recognition and classification of the candidate. In this project a deep learning model is made to develop automated face detection and recognition for detecting impersonation of candidate in examination system. Automated face detection and recognition system using convolutional neural network can further be used in Hall Number, Seating Allocation, identity verification and attendance monitoring in examination system. The proposed deep learning model comprises of two steps: enrolment and authentication.

***Key Words*:** Fake clearance card, Hall ticket, Examination, Seating Allocation , Attendance monitoring

1.INTRODUCTION

Education as a planned undertaking, at a personal level on a small scale or institutional level on a large scale, aims at making student capable of becoming active, responsible, productive, and caring members of society. They are made be acquainted with the various practices of the society by imparting the relevant skills and ideas. Education encourages the students to analyses and evaluate their experiences, to doubt, to question, to investigate – in other words, to be inquisitive and to think independently and acquire proficiency.

1.1 EXAMININATION

Exams and tests are a great way to assess what the students have learned with regards to particular subjects. Exams will show what part of the lesson each student seems to have taken the most interest in and has remembered. With every pupil being so individual, exams are also a great way for teachers to find out more about the students themselves. The test environment comes with added stress, which allows teachers to work out how their students argue and how they think individually by their works, which is a great attribute for them to keep in mind for future class activities.

1.2 PROBLEM IDENTIFICATION

The major problem that occurs in examination system is malpractices. This is identified due to the absence of credible identity verification system for offline and also for online examinations. In order to overcome the above problem researchers have focused on the use of artificial intelligence and use of biometrics.Face recognition has been a popular topic in real AI applications since face recognition is crucial in human-computer interaction and is often applied to security systems, commercial monitoring, etc. Artificial intelligence and hardware acceleration have combined to improve the efficiency of face recognition applications. Although fingerprint recognition is less complex, face recognition is more secure and more. Difficult to duplicate.

1.3 ARTIFICIAL INTELLIGENCE

AI goes well beyond the automatons of science fiction, into the non-fiction of modern-day advanced computer science. Professor Pedro Domingo's, a prominent researcher in this field, describes "five tribes"of machine learning, comprised of symbolists, with origins in logic and philosophy; connectionists, stemming from neuroscience; revolutionaries, relating to evolutionary biology; Bayesians, engaged with statistics and probability; and analogizes with origins in psychology. Recently advances in the efficiency of statistical computation have led to Bayesians being successful at furthering the field in a number of areas, under the name "machine learning". Similarly advances in network computation have led to connectionists furthering a subfield under the name "deep learning". Machine learning (ML) and deep learning (DL) are both computer science fields derived from the discipline of Artificial Intelligence. Further, with the advent of IoT, sensor technology exponentially adds to the amount of data to be analyzed -- data from sources and places and objects and events that have previously been nearly untouched.

1.4 DEEP LEARNING

The algorithms are no longer limited to create an explainable set of relationships as would a more basic regression. Instead, deep learning relies on these layers of non-linear algorithms to create distributed representations that interact based on a series of factors. Given large sets of training data, deep learning algorithms begin to be able to identify the relationships between elements. These

relationships may be between shapes, colors, words, and more.Within machine learning and artificial intelligence, the power of deep learning stems from the system being able to identify more relationships than humans could practically code in software, or relationships that humans may not even be able to perceive data.

2. LITERATURE SURVEY

2.1 A Hybrid Algorithm for Face Detection to Avoid Racial Inequity Due to Dark Skin:

There has been significant development in the facial recognition technology during past few decades. This technology has been widely used by different organizations and governments for defense, security, and surveillance projects. Furthermore, it has now been incorporated into our daily usages, such as consumer applications, personal data protection, or cyber-security, particularly while using smartphones. Most of these systems work very efficient, however, there are some challenges related to the accuracy of results of facial recognition systems when tested on images of people with dark skin. This article highlights the variation in accuracy of existing facial recognition algorithms when applied to dark-skinned people. Furthermore, as a principal contribution it presents a hybrid algorithm based on Gaussian and Explicit rule model that improves the accuracy for face-detection for dark skinned people. The results showed that Gaussian and Explicit Rule hybrid algorithm optimally improved the face detection rate for with dark skin.

2.2 An End-To-End Emotion Recognition Framework Based on Temporal Aggregation of Multimodal Information:

Humans express and perceive emotions in a multimodal manner. The multimodal information is intrinsically fused by the human sensory system in a complex manner. The feature descriptors for audio and video representations are extracted using simple Convolutional Neural Networks (CNNs), leading to real-time processing. Undoubtedly, collecting annotated training data remains an important challenge when training emotion recognition systems, both in terms of effort and expertise required. The proposed approach of end-to-end neural network architecture, called TA-AVN solves this problem by providing a natural augmentation technique that allows achieving a high accuracy rate even when the amount of annotated training data is limited. This article proposes a novel audio-visual multimodal fusion framework for emotion recognition based on a random selection of analysis windows collected from individual temporal segments of the input video and the proposed method can be easily adapted to work also when the amount of available annotated data is limited.

2.3 Exposing Fake Faces Through Deep Neural Networks Combining Content and Trace Feature Extractors:

With the breakthrough of computer vision and deep learning, there has been a surge of realistic looking fake face media manipulated by AI such as Deep Fake or Face2Face that manipulate facial identities or expressions. The fake faces were mostly created for fun, but abuse has caused social unrest. For example, some celebrities have become victims of fake pornography made by Deep Fake. There are also growing concerns about fake political speech videos created by Face2Face. To maintain individual privacy as well as social, political, and international security, it is imperative to develop models that detect fake faces in media. This article proposes a hybrid face forensics framework based on a convolutional neural network combining the two forensics approaches to enhance the manipulation detection performance. To validate the proposed framework is used a public Face2Face dataset and a custom Deep Fake dataset collected on our own. The proposed model is a type of convolutional neural networks containing two types of feature extractors to simultaneously extract content features and trace features from a face image.The former feature extractor is trained by transferring and fine-tuning the feature extractor of a pre-trained object recognition model. Thus, the extracted features are specialized to represent various contents in a face. The latter feature extractor is based on the local relationship between neighboring pixels, by first applying the multi-channel constrained convolution.

2.4 Face Recognition Attendance System Based on Real-Time Video Processing:

College attendance management for students has become one of the hot issues in the society, so the management of college students should be strengthened. However, most college students still use traditional manual attendance for daily attendance, using paper signatures or teacher orders, but now with the gradual rise of technology, some new methods point out that gradually, a few colleges and universities will use punch card fingerprints and smart attendance methods. Although there are some ways to stimulate attendance, the effect is not so effective. This article proposes a linear discriminant analysis (LDA) algorithm to overcome the above issues. This algorithm is to find a set of linear transformations that minimize the intra-class dispersion between each category and maximize the inter-class dispersion.

3.EXISTING SYSTEM

Facial recognition is a technology that is capable of recognizing a person based on their face. It employs machine learning algorithms which find, capture, store and analyses facial features in order to match them with images of individuals in a pre-existing database. Early approaches mainly focused on extracting different types of hand-crafted features with domain experts in computer vision and training effective classifiers for detection with traditional machine learning algorithms. Such methods are limited in that they often require computer vision experts in crafting effective

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features, and each individual component is optimized separately, making the whole detection pipeline often sub-optimal. There are many existing FR methods that achieve a good performance

K-NEAREST NEIGHBORS

One of the basic classification algorithms in machine learning is known to be the k-NN algorithm. In machine learning, the k-NN algorithm is considered a well monitored type of learning. It is commonly used in the sorting of related elements in searching apps. By constructing a vector representation of objects and then measuring them using appropriate distance metrics, the similarities between the items are determined. Face Recognition Applications are Attendance System, Security System and Smart Home Automation System. Face recognition-based voting system are proposed.

3.1 DISADVANTAGE

The accuracy of the system is not 100%.Face detection and loading training data processes just a little bit slow. It can only detect face from a limited distance. The instructor and training set manager still have to do some work manually. Handcrafted feature. High Computational Complexity

4.PROPOSED SYSTEM

Face detection and recognition system for identity verification and attendance monitoring in the examination system. Fraud with respect to hall tickets and designs an automated system for impersonation or cross checking hall tickets using image processing techniques. The major problems occur in examination systems are malpractices. The fundamental Problem identified is the absence of a credible identity verification system for offline and also for online examination system. The solution for this problem is an examination system designed based face detection and verification technology incorporating the security strength of examination and the accuracy. Impersonation is nothing but to pretend to be for purposes of fraud or to assume the character or appearances of especially fraudulently, which is one of the main problems to be addressed in our project. Secondly in case of impersonation is detected whether the candidate is authenticated or not. If the person is authenticated his attendance also recorded. The message has to be sent to the exam in-charge by using alarm whether the candidate is authenticated or not. Deep learning in the form of Convolutional

4.1 FACE REGOINNITION - DCNN

CNNs are a category of Neural Networks that have proven very effective in areas such as image recognition and classification. CNNs are a type of feed-forward neural networks made up of many layers. CNNs consist of filters or kernels or neurons that have learnable weights or parameters and biases. Each filter takes some inputs, performs convolution and optionally follows it with a non-linearity. A typical CNN architecture can be seen as shown in Fig.3.3.The structure of CNN contains Convolutional, pooling, Rectified Linear Unit (ReLU), and Fully Connected layers.

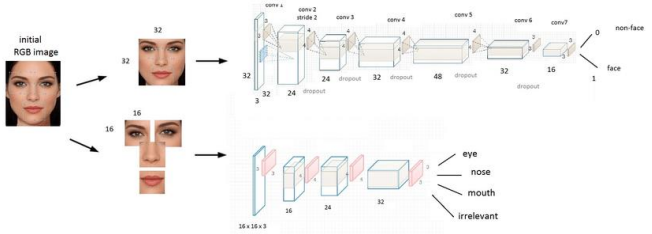

Fig -4.1: Face Recognition

A.Convolutional Layer:

Convolutional layer performs the core building block of a Convolutional Network that does most of the computational heavy lifting. The primary purpose of Convolution layer is to extract features from the input data which is an image. Convolution preserves the spatial relationship between pixels by learning image features using small squares of input image. The input image is convoluted by employing a set of learnable neurons. This produces a feature map or activation map in the output image and after that the feature maps are fed as input data to the next convolutional layer.

B.Pooling Layer:

Pooling layer reduces the dimensionality of each activation map but continues to have the most important information. The input images are divided into a set of non-overlapping rectangles. Each region is down-sampled by a non-linear operation such as average or maximum. Robust to translation and distortion and is usually placed between convolutional layer

C.ReLU Layer:

ReLU is a non-linear operation and includes units employing the rectifier. It is an element wise operation that means it is applied per pixel and reconstitutes all negative values in the feature map by zero. In order to understand how the ReLU operates, we assume that there is a neuron input given as x and from that the rectifier is defined as f(x)= max (0, x) in the literature for neural networks.

D.Fully Connected Layer:

Fully Connected Layer (FCL) term refers to that every filter in the previous layer is connected to every filter in the next layer. The output from the convolutional, pooling,

and ReLU layers are embodiments of high-level features of the input image.

4.2 ADVANTAGE

The system stores the faces that are detected and automatically marks vaccinated or not or Dose.Provide authorized access. Multiple face detection.Provide methods to maximize the number of extracted faces from an image. Ease of use.Manipulate and recognize the faces in real time using live video data. Multipurpose software. Can be used in different places.Fraud Alert.

CONCLUTION

Traditionally student's attendance in exam hall were taken manually by professor and it has to consume too much time of students as well as professor. A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, works by pinpointing and measuring facial features from a given image. In the proposed system, we have developed face recognition system ready to be implemented for the purpose of live examinee authentication with minimal human interaction to verify the candidate using Convolutional Neural Network. This System represent an analysis of different technologies which are used for taking attendance system. Further it can be replaced by fully computerized system. This system can be implemented for better results regarding the management of attendance during exam. This system will save time; decrease the amount of work the administration has to do. The proposed classifier performance evaluation was presented as a confusion matrix, in terms of sensitivity, specificity, precision, accuracy, and F1score. Results indicated that the proposed classifier has achieved higher recognition accuracy than ten other classifiers of the state of art.

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