International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 08 Issue: 07 | July 2021 www.irjet.net p-ISSN: 2395-0072

Real-Time Face Recognition in Attendance System using DCNN

Dr.K.Karuppasamy[1], S.Surya[2], I.Rishikumar[3], A.Aravith[4]

[1]HOD of CSE Computer Science and Engineering, RVS College of Engineering and Technology, Coimbatore-641402, Tamil Nadu

[2,3,4]Final year B.E., Computer Science and Engineering, RVS College of Engineering and Technology, Coimbatore-641402, Tamil Nadu

---

Abstract: The human face is an important entity that plays a major role in our daily social uses, like conveying a separate identity. The Face recognition system is also able to recognize the person from a distance without gives any disturbance to the person. For face recognition purposes, we need large data sets and complex features. Large data sets are used to uniquely identify the different subjects. For this we need to manipulating different obstacles like illumination, propose this project we propose a deep unified model for Face Recognition based on Faster Region Convolution Neural Network(RDCNN).In our proposed system, we have a several classrooms of a specific institute in which we set up our face recognition system for making smart classrooms. Several images from different smart classrooms are being sent simultaneously for processing to take the attendance. To measure the validity of our application we used a group-based web application attendance system. Then the staff is not attending the class at the correct time then this system is automatically passing the intimations to consent staff. If staff not attending a class at the correct time our proposed system passes the intimations to alternative staff.

Keywords: Region Convolution Neural Networks(RDCNN),unique, automatically passing, intimation.

1. INTRODUCTION

Attendance marking is One of the most important works in colleges. This work is carryout easy in nowadays using face recognition technology. Previously there are many methods for marking attendance like Fingerprint Based recognition systems and RIFD based systems and iris-based recognition systems. These devices are capable of automating human activities. Face recognition has also implement that makes smart attendance systems in institutions. In the currently available smart architecture deployed the data produced by the nodes are passed to the cloud. It's used for further processing. High computational power (which is required for the deep learning algorithms) is used to increase the accuracy of the recognition. To achieve better results, the proposed algorithm utilizes the Convolution Neural Network, which is a deep learning approach and state-of-the-art in computer vision. The proposed methodology can recognize the people even when a frame has multiple faces. The previous attendance system only concentrate on the present and absent but here we implement send notifications to intimate about their class. In this biggest problem is to be if staff absent means there is no use intimation so here provide one facility admin can the change time table according to staff attend the institution.

2. LITERATURE SURVEY

1)Recognition Facial Expression with Convolution Neural Networks: Using copies of few data and the training sample order

Facial expression recognition (FER) is a very challenging task in computer vision. To clear the Facial Expression Recognition problem they use Deep Comprehensive Multi-patches Aggregation Convolution Neural Networks (DCMA-CNNs). DCMA_CNN is works based on a deep-based framework. This algorithm mainly consists of two branches of Convolution Neural Network (CNN). One branch extracts local features, it's obtained from image patches. And other use whole expressional images for extracts holistic features. Here aggregate both local and holistic features before making it into the classification. Two branches are types of hierarchical features, which represent expressions in different scales. This model can represent expressions more broadly. But it's very hard for researchers and difficult to track the result.

2) Capture facial expression recognition Using DCMA-CNN Algorithm

One of the most complicated things is to get facial expression recognition in the changing variation of facial physical structure from video. Here they use a Part-based Hierarchical Bidirectional Recurrent Neural Network (PHRNN) for recognition. This algorithm is used to analyze the facial expression information of continuous sequences. Here facial recognition is done by using geometry information which is called temporal features. Multi-Signal Convolution Neural Network (MSCNN) is proposed to

extract "spatial features" from still frames to solve complement the still appearance information. The disadvantage of this method is low frequency and uncontrolled environment and in cross-database evaluation. But the drawback is to extract a temporal pattern is very hard.

3) Facial Expression Recognition using Local Directional ternary pattern(LDTP)

This paper handle different way of recognition than other techniques, why means they use local directional ternary pattern(LDTP) like parts of the face. LDTP efficiently captures and encodes information of emotion-related features (i.e., eyes, eyebrows, upper nose, and mouth).To capture emotion-related features it's using directional information and ternary pattern. To improve the advantage of the robustness here they overcome weaknesses of edge-based methods in the smooth area.

4) Laboratory Attendance System using Dashboard Website Based on facial Recognition System

This paper uses the combination of convolution neural networks and specific image processing steps to solve the facial expression recognition challenge. CNN(convolution neural network) gains better accuracy with big data. There is no availability of datasets for facial expression recognition with deep architecture in public. so they
Only track the expression-specific feature from a face. Here proposes method gain good result.

3. STUDY OF ATTENDANCE SYSTEM

I. PROPOSED SYSTEM

Project working with four different stages:
1) Level 1: At the first step we need to create an enrolment phase here we create two data phases one for staff information and another for storing attendance.

2) Level 2: The second level is verification here, it is done with DCNN with the help of a pattern classifier, the extracted features of the face image are compared with staff database images.

3) Level 3: If the Face recognition is done successfully then face authentication will allow marking attendance.

4) Level 4: if attendance is not marked within a time we need to send a notification to staff and admin through SMS.

II. IMPLEMENTATION OF THE MODEL

1. Every New User in the college will first register for attendance. So, we need to feed the information into the staff database.

2. At that time of Registration, the System Capture the Face of the user by using a Web Camera and Store the staff database with the roll number and name and class of the staff.

3. At the face acquisition is the initial part of the system. Logitech C270 (3MP) is used for image acquisition.

4. The acquired images are converted to grayscale images and then resize. After the removal of noise using mean and Gaussian filters, all further operations are performed on this image.

5. After capturing the image, the image is given to the face detection module. Region Proposal Network (RPN) draws anchors and outputs for face recognition. It's most likely contains the objects.

6. The module composes a very short feature vector that is well enough to represent the face image. Here, it is done with the DCNN method. Then the classified result is stored in the database.

7. After the verification of faces and successful recognition is done, the attendance of the staff is marked in front of his/her roll number.

8.And then they will also be notified of the attendance by SMS.IF the staff will be absent in a particular period this system automatically passes that intimation to alternative staff.

III. DESIGN / METHODOLOGY

This proposed system is a web-based system so basic features related to system techniques such as client-server, database, image processing properties determine the software requirement of the system.

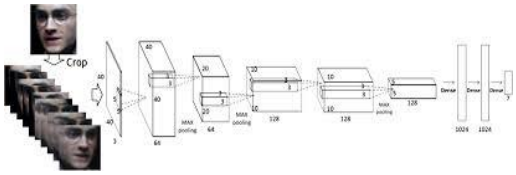
The software product is a standalone (network connection is mandatory). The system is mainly for two things. They are maintaining attendance and another one is for sent intimation to the appropriate staff. Here we use RCNN for draws and anchor outputs. For face recognition, the DCNN methodology is used.

IV. FACE DETECTION USING DCNN ALGORITHM

A convolutional Neural Network is a type of unreal neural network. It's mostly used for analyzing visual imagery. This is work by Hubel and Wiesel in the 1950s and 1960s showed the cat visual cortices that contain neurons it individually respond to regions of the visual field.

Convolutional neural networks are one of the multilayer perceptrons version. Multilayer perceptrons mean fully connected networks. Fully connected means one layer of neurons is connected to all other neurons in the next layer. The Full connectivity of neurons of CNN networks gives us prone to over fitting Data. Here over fitting includes penalizing parameters(like weight decay)

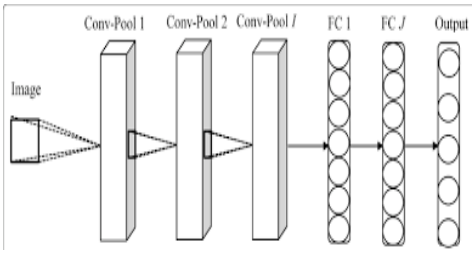
during training or trimming connectivity. Here Trimming connectivity means skipped connections and drop out.



Convolution neural networks are not only for face recognition but also used for recommender systems, image classification, medical image analysis, image segmentation, computer interface, natural language processing, and brain time series.CNN performs different operations towards regularization. It takes advantage of hierarchical patterns and assembles patterns and simpler patterns. Hierarchical pattern to get data, and assemble pattern is used to increasing complexity using smaller. And finally simpler pattern embossed in their filters.

Convolutional Neural Networks works based on a biological process, which means in that the connectivity pattern between neuron reassembles the organization with each other neurons. A sensory is also based on an Animals location are in the case of place cells. Sensory space also maps into a particular Animal's body like hair in the cochlea, piece of skin, retina, tongue, or another part also. The parts are identified using neurons of the auditory system and the visual system.

Computer vision tasks need to perform acquiring, processing, analyzing. And they want to understand the digital images and obtain high-dimensional data from our real world. For producing numerical or symbolic information. We can get image form data from videos, views of multiple cameras, and 3D scanners or medical scanning devices.



This is based on pre-processing compared to others image processing classifications. Why means networks learn how to optimize the filters automatically. But traditional algorithms are these filters hand-engineered. It's independent of human interaction in feature extraction. This is the major advantage of our DCNN algorithm.

Region Proposal Network (RPN) draws anchors and outputs the one which most likely contains the objects. Deep convolution neural network architecture is developed for recognition. The edge computing processes the data at the edges of the nodes, here the edge is a computing device and network resource along with the dedicated path of generated data sources and cloud data centers.

Design a face attendance system based on the proposed deep convolution neural network model. The proposed model can recognize thirty faces out of the thirty-five detected faces. Achieve an accuracy of 97.9% by implementing the DCNN algorithm. Edge Computing has been utilized for processing the data at the edges of the nodes to reduce the data latency and increase the real-time response.

V. RESULTS AND DISCUSSIONS

As we see that existing attendance system has many defects such as lengthy process, time taking, not secure, there is no security and no option to send intimation. But now we can say that our approach is more useful and secure and useful than the existing system. Highly fast working because in this project we have to use face recognition using RCNN algorithm and face comparison so the false user can't give attendance. We can access results faster than the existing system.

4. CONCLUSION

This System use Neural Networks (CNN) for recognition, that outperforms the traditional techniques. An automatic attendance system is used to minimize human errors. Which takes place in the conventional attendance-taking system to validate the efficiency of the proposed algorithm. The basic aim is to automate the system and implement smart staff attendance which is useful for educational organizations. Faster Region Convolution Neural Network along with the Edge Computing techniques is utilized to achieve the state-of-the-art results. The system managed to recognize 30 faces out of 35 detected faces, the achieved accuracy can be more enhanced by taking clearer images of staff. Although the system is achieving higher accuracy, the main limitation of the system is distance, naturally as a distance increases, the picture becomes blurry, And also sends notifications about attendance.

REFERENCES

[1] H. Li, K. Ota, and M. Dong(2018), ``Learning IoT in edge: Deep learning for the Internet of Things with edge computing,'' IEEE Netw., vol. 32, no. 1, pp. 96_101.

[2] W. Shi, J. Cao, Q. Zhang(2016), Y. Li, and L.Xu, ``Edge computing: Vision and challenges,'' IEEE Internet Things J., vol. 3, no. 5, pp. 637_646, Oct. 2

[3]G. B. Huang, M. Mattar(2008), T. Berg, and E. Learned_Miller, ``Labeled faces in the wild: A database forstudying face recognition in unconstrained environments,'' in Proc. Workshop Faces `Real-Life' Images, Detection, Alignment, Recognit., pp. 1_11.

[4]R. G. Cinbis, J. J. Verbeek, and C. Schmid(2011), ``Unsupervised metric learning for face identi_cation in TV video,'' in Proc.ICCV, pp. 1559_1566.

[5] C. Lu and X. Tang(2015), ``Surpassing human-level face verification performance on LFW with gaussianface, pp. 2307_2319.

[6] L. Wolf, T.Hassner, and I.Maoz(2011), ``Face recognition in unconstrained videos with matched background similarity,'' in Proc. CVPR, pp. 529_534.

[7] Z. Liu, P. Luo, X.Wang, and X. Tang(2015), ``Deep learning face attributes in the wild,'' in Proc. IEEE Int. Conf. Comput. Vis, pp. 3730_3738.