CSE 4020 - MACHINE LEARNING

G2 SLOT

DIGITAL ASSIGNMENT-1

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Question:

You have to download 6 to 8 recent journal papers from reputed journal (IEEE, Elsevier, Springer, MDPI, Hindawi etc.) belonging to same machine learning application like covid19 reproduction rate prediction. Read out the paper completely and go through the methodology used, Results, Performance metrics, pros and cons. Try to find out a core pitfall for future work from these papers.

TOPIC: IMAGE PROCESSING (FACE DETECTION)

SL. No.	Paper title and Year	Method (Algorithm)	Results (performance metrics)	Advantage and Limitation
1.	Face- Recognition Based - Attendance System Using Machine Learning Algorithms (2018)	The proposed system for face recognition using both computer vision and machine learning techniques. The Machine learning techniques that are used for classification are Support Vector Machine(SVM), Multi Layer Perceptron(MLP) and Convolutional Neural Network (CNN) The face detection is accomplished the usage of robust DNN base face detector. The pre-trained module is trained with wide variety of images. The accuracy of the DNN primarily based totally face detection is extra than state of art methods. SVM, MLP and	The SVM has got the test accuracy of 87%, MLP got accuracy of 86.5% and CNN with 98% on the self-generated database respectively. While checking actual time output, face enter is taken via digital digicam. Due to the elements like digital digicam quality, illumination the result accuracy decreases. There is around 56% accuracy for both SVM and MLP classifiers and	Advantages: There could be issues sometimes when biometry is used like when there are any cuts in finger. Thus face detection can help in a better way for attendance

Limitations: For robust attendance system good quality cam have to be used however it isn't used here. And in place of showing name of a person in image, excel sheet for the present college |

		CNN algorithms are used as a classifier to evaluate and compare for the face recognition.	around 89% for CNN	students may be made for Attendance. Also faces of extra variety of individuals in different environments are not used for classification
2.	Evaluation of Machine Learning Techniques for Face Detection and Recognition (2012)	A model of the Viola-Jones face detector is applied on OpenCV changed into used for face detection. Faces have been detected with the featurecvHaarDetectObjects, the use of the provided Haar Classifier Cascade. KNN,LWL ,Naïve Bayes ,Deision Tree ML techniques are used for classification and a comparative study has made	3 different dimension pictures are taken as data input and for 25x25 dimension picture The accuracy for KNN it is 80% , for LWL it is 55%,Naïve bayes it is 66% , Decision Table it is 58.3%and for Decision tree it is 83.3%.

For 50x50 dimension picture The accuracy for KNN it is 80% , for LWL it is 56.6%,Naïve bayes it is 30% , Decision Table it is 51.6%and for Decision tree it is 20%. | Advantages: This Evaluation helps in finding the better Algorithm among the given and based on dimensions the algorithm which gives best results can be selected.

Limitations: The model has given a study on images with certain dimensions only. The model didn't consider a dataset for recognizing faces in real time camera or in a video. |
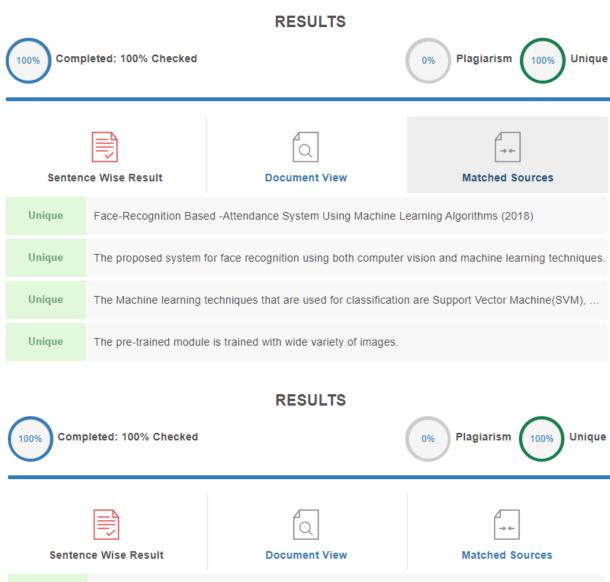
			For 75x75 dimension picture The accuracy for KNN it is 98.3% , for LWL it is 78.3%,Naïve bayes it is 100% , Decision Table it is 85%and for Decision tree it is 100%.	
3.	Face Recognition Using Python Kernel Principal Component Analysis (2002)	This paper adopted kernel PCA as a mechanism for extracting facial features. Linear SVMs are used for face recognizer. SVM is a natural preference due to its robustness even in absence of a big set of training examples. The fulfillment of SVMs in face recognition and other associated problems , gives us with the further motivation to rely upon SVMs as the recognizer. SinceSupport Vector Machine's has proposed for two-class classification, their fundamental scheme is prolonged to multiclass face recognition through adopting one-per-class decomposition	The proposed method produced better results and a significant reduction in the error rate (16.7%) compared with the performances of the best existing system-linear SVMs . The 2.5% error rate reported for the proposed method was an average of 20 simulations, however, the individual simulations had given error rates as low as 1.5%.	Advantages: It gives a better result and significant reduction when compared to the best existing Systems.

Limitations: The 2.5% error rate reported for the proposed method was an average of 20 simulations, however, the individual simulations had given error rates as low as 1.5%. |

4.	Face-Recognition System Using Machine Learning Algorithm (2020)	This paper has analyzed and compared different Algorithms. They used Linear Discriminant Analysis, Naive Bayes Classifier, Support Vector Machine Algorithms as classifiers. A research is used to automatically detect the face of the person. The ORL dataset is used to perform experiments. Firstly, the dataset is segmented into sections in 3 one of a kind configurations A (60:40), B (70:40), and C (90:10). The first segment is used for learning purposes and the second one segment is used for device evaluation. The important data is extracted from the input pictures with PCA. Later, they are experimented the use of linear discriminant analysis, multilayer perceptron, naive Bayes, and support vector machine.	In this paper, These have achieved recognition accuracy of 90% on A ,accuracy of 97% on configuration B & 100% on configuration C by using PCA and Linear Discriminant Analysis.	Advantages: By comparing different algorithms can help us know better about which Algorithm suits for Face detection. Limitations; More face detection difficulties such as orientation variation, lighting, poses, and facial expression variations will be found. No such data used in dataset. So no proper algorithm is found for such data.
5.	Face Recognition using OpenCV and python (2014)	An ANN (Artificial Neural Network) is utilized in face recognition which contained a single layer which suggests adaptiveness in critical	The paper explained a new/unique approach of face recognition using Neural Networks and the results gave a good comparative	Advantages: The new model which is using Neural networks is given which gave better results compared to

		face recognition systems. The face verification is performed the usage of a double layer of WISARD in neural networks. Graph matching is different alternative for face recognition. The item in addition to the face recognition may be formulated the usage of graph matching achieved through optimization of an identical function.	results with accuracy of 80% from the dataset that they have considered	certain universal methods Limitations: The modal is not very effective and doesn't detect the face when there is face inclination or no proper lighting or based on facial expressions. Data set containing such type of images are not used here.
6.	FACE RECOGNITION and ATTENDANCE SYSTEM USING MACHINE LEARNING (2019)	The proposed automatic attendance control machine is primarily based totally on face recognition. Using the digital digi cam we are able to take a photo of the entire classroom, followed with the aid of using detecting person faces on the image, recognizing the students after which they are updating their attendance in database. Some of the algorithms proposed for face detection are Face geometry primarily based totally techniques, Feature Invariant techniques, Machine learning based techniques. Out of these types of techniques they selected Viola and Jones framework which uses	In real time scenarios LBPH outperforms different algorithms with higher recognition rate and low false positive rate. SVM and Bayesian additionally prove to be higher classifiers in comparison to distance classifiers.	Advantages: This model can use camera to detect the students in the class and mark attendance Limitations: The model did not enhance the recognition rate of algorithms while there are unintended changes in a person like tonsuring head, using scarf, having beard. The system evolved recognizes faces having an angle variation which needs to be advanced further

		Integral Image and AdaBoost learning algorithm as classifier that offers good outcomes in different lighting situations to acquire a higher detection rates. LBPH classifier to recognize individuals.		
7.	REAL-TIME FACE DETECTION AND TRACKING USING OPENCV (2014)	Different methods and algorithms of face detection were reviewed on this paper. Three Different algorithms i.e. Haar cascade, adaboost, template matching have been described . The preference of a face detection method in any study ought to be primarily based totally at the particular demands of the application.	None of these current methods are universal best method for all applications. Haar-like features are used to categorize subsections of an image.and resulting with an accuracy of 72.3%. The key benefit of a Haar-like features over many remaining features is its calculation speed.	Advantages: The model can detect and Track any person based on the Facial detection. Limitations: The paper gives a complete new way of implementing face detection algorithmswhich canbe used at higher levels as they use a lot of technologies like intel open source.

Plagarism Report:

RESULTS

100% Completed: 100% Checked   0% Plagiarism   100% Unique

Sentence Wise Result	Document View	Matched Sources

Unique	Face-Recognition Based -Attendance System Using Machine Learning Algorithms (2018)
Unique	The proposed system for face recognition using both computer vision and machine learning techniques.
Unique	The Machine learning techniques that are used for classification are Support Vector Machine(SVM), …
Unique	The pre-trained module is trained with wide variety of images.

RESULTS

100% Completed: 100% Checked   0% Plagiarism   100% Unique

Sentence Wise Result	Document View	Matched Sources

Unique	An ANN (Artificial Neural Network) is utilized in face recognition which contained a single layer which …
Unique	The face verification is performed the usage of a double layer of WISARD
Unique	Graph matching is different alternative for face recognition.
Unique	The item in addition to the face recognition may be formulated the usage of graph matching achieved…