AN ENHANCED APPROACH FOR FACE ATTACK DETECTION USING APPLICATION OF R-CNN

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Abstract

Today the leading cause of reduced security is face attack that affects person's identity as well as security system's activities. Traditionally the mechanism is utilized for detecting face attack is not so accurate, user friendly and also they are time consuming. Therefore in this paper a hybrid approach is used that detect face attack by eliminating replicated features. It utilizes R-CNN mechanism that has great attack detection rate The result of the proposed system as compared to existing system is better by the margin of 8 to 10%.. The primary reason for the betterment is because of contrast enhancement and scaling factor at pre-processing and objective function overhead consideration at segmentation and classification phase. The results are shown in terms of accuracy and MSE.

Keyword: R-CNN method, MSE, face attack.

INTRODUCTION

The main control centre of security system is identity that manage the overall activities of security system like movement , memory etc. there are various disabilities that affect identity activities . these are known as face attack. The attacks damage the identity and also affect the person's security and other daily life's activity. The various detection methods are used for detecting face attack and it utilizes images of identity. But the current methods are not user friendly and invasive so there is need to develop convenient , non invasive and user friendly detection and detection system of face attack. The image processing technique are utilized for this purpose. Image segmentation is the process in which image is partitioned into multiple regions which results into number of fragments of objects. The main purpose of image segmentation is to make modifications and simplifications in an image to make it more clear and meaningful. The main feature of segmentation is to find boundaries and objects in an image .Resultant of image segmentation composed of multiple regions that entirely cover the whole image. Pixels in a common area are alike to each other on the basis of some computed property such as color, texture. It is computer based process of bringing out useful information from the images. Input is the image and process ends with an output that is data which is

numerical. Image processing is a technique by which we can change the input image by applying mathematical algorithms to produce an output image that is enhanced.

Literature Survey

Ms. Pooja S. Deshpande1, Prof. S.J. Honade, 2017 presented [1] a firefly algorithm for detection and segmentation of attack in the identity using images, this is the algorithm which work in an sequence manner from attack to image. Firstly,the area of the whole attack is segmented and then the abnormal images are separated based on obtained area of attack. The Firefly Algorithm has provide us with a better parameters like delay time (0.0195214 Sec.), attack percentage is (1.4016429%), this is used for diagnosis of attack using images. Therefore the firefly algorithm has provide with a better and clear results as compared to linaer SVM algorithm , Radial basis SVM and Qudratic SVM algorithm as the region that is segmented is better and delay time is also less. So, the FA is the better .

Emrah Hancer1, Celal Ozturk2 and Dervis Karaboga,2013 presented[2] Artifical bee colony algorithm for detection and segmentation of attack in the identity using FACE images. This proposed methodology works on 3 principles .Firstly, noise is removed from and image is enchanced . Secondly image is processed using ABC and in last final post processing is performed to extract identity attack. The proposed methodology has been compared with K-means, GA, FCM based image segmentation methodologies. The ABC has a powerful numerical and visual outputs for diagnosis of attack.

Abdalla Mostafa et.al, 2015 presented[3] Artifical bee colony algorithm for face segmentation. Correct face segmentation plays a vital role in computer aided diagnosis (CAD) system. Cad is composed of 3 phases that is pre processing ,segmentation and classification. This paper has proposed a face segmentation by using clustering process that is boost up by ABC. In preprocessed phase image annotations are removed and ribs are joined, ABC is applied for having initial segmentation of face. At last, refining is done by region growing approach to have final segmented output. Experimental results obtained from 38 CT images demonstrate excellent segmentation.

Tinali Kamble, PrachiRane, 2013 presented[4], proposed swarm intelligence approach for face attack detection . Previous work done in the field of attack detection and segmentation have also discussed in this paper. This methodology provide us with the better visual results of face attack segmentation .the proposed work further can be continued with classification of face attack by applying artificial neural network.

M.Mary Synthuja Jain Preetha et.al, presented[5], an algorithm for color image segmentation that is totally based on region growing.Basicaly it has phases,In first phase selection on initial seeds are done by having analysis of histogram than regions are allowed to grown from these selected seeds.In next phase threshold is optimized again but the use of cuckoo search algorithm. At last results of both has been compared against various evaluation parameters.

Xiaolin Zhang, Tao Yang et.al ,2015 presented[6], the limitations of older technique that is 2d entropy threshold segmentation. The researcher has proposed a flame image segmentation method that utilize artificial bee colony algorithm having the properties of levy flights. By utilizing strategy of levy flight id creates a recently created space of local search and increase the convergence rate. Computational results provide us with a methodology that is powerful in means of threshold selection correctness and reduced run time.

PROPOSED SYSTEM

The proposed attack detection component takes the upsides of R-CNN to distinguish any strange highlights brought from the picture. Highlights are coordinated against the unusual element esteems. on the off chance that variation from the norm is identified, it is shown to the client. The proposed system is given regarding stream diagrams as under
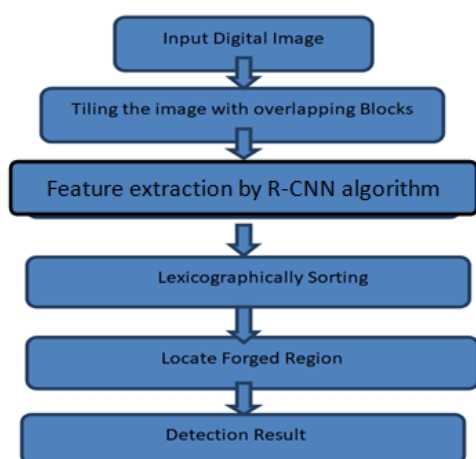

Fig 1: Proposed Methodology

1. **Performance Analysis and Results**

Performance of the proposed system is judged in terms of accuracy. Value of the actual system is compared against the approximate value and result obtained gives the error. Higher the error, lower will be the accuracy. The result in terms of accuracy is given as under

Image	MSE Existing	MSE Proposed
Image1	6.2356	3.001
Image2	4.166	2.97
Image3	5.8328	2.3

Image4	2.02	2.3
Image5	4.4905	3.1
Image6	6.1212	2.9
Image7	6.5423	4.01

Table 1: Plot of MSE

Plots of result is given as under
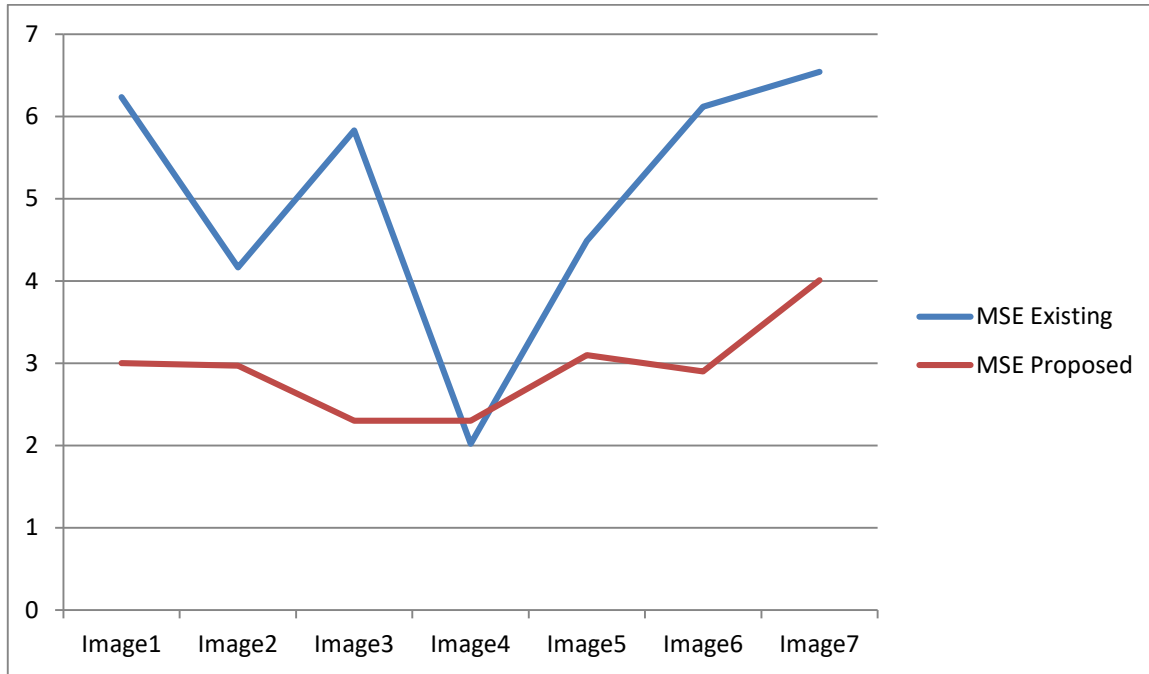
Image	Accuracy Existing	Accuracy Proposed
Image1	92.4577	93.999
Image2	95.8337	97.0246
Image3	93.1672	97.696
Image4	97.5095	97.6952
Image5	97.0592	98.8875
Image6	95.8788	96.0778
Image7	95.4577	98.999
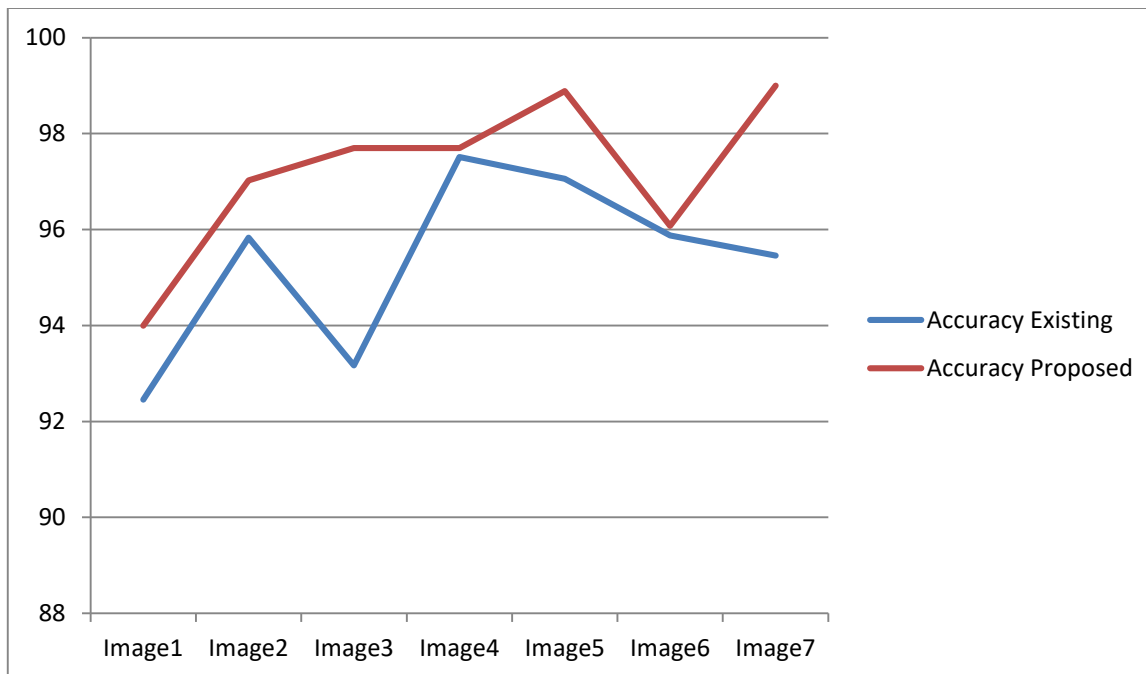
Proposed system accuracy is significantly higher as compared to existing literature. R-CNN uses iterative approach which produces better result as compared to existing direct approach.

Conclusion

The hybrid approach for face detection mechanism used in the proposed system eliminates the replicated features and thus forged images are detected at great rate. The result of the proposed system as compared to existing system is better by the margin of 8 to 10%.. The primary reason for the betterment is because of contrast enhancement and scaling factor at pre-processing and objective function overhead consideration at segmentation and classification phase. Since we are working upon the medical field, so quick result generation is the need of the hour. This is achieved using the proposed system. Individual colour distinct features obtained can be used for real time images also for attack detection. In future this mechanism can be tested against the real time images and performance can be tested on GPU with deep learning..

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