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ANALYSIS AND DETECTION FOR MEDICAL IMAGES USING VARIOUS HISTOGRAM TECHNIQUES

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ABSTRACT

Medical Images play a major role in analyzing the abnormalities in human body. Modern medical instruments are able to produce different views of images which can be used for better diagnoses and accurate treatment. In this project an application of digital image processing and analysis techniques has been discussed, which can be useful in healthcare domain to predict major diseases from human being. Medical image statistics plays an important role in image denoising, various natural image priors, including gradient-based and sparse representation-based. In this project, we propose a texture enhanced medical image denoising method by enforcing the gradient histogram of the denoised image to be close to a reference gradient histogram of the original image.

Medical authentication is quite common in this technological world. All the previous works are based on luminance. But here we used chrominance. First we separate the YCbCr component from RGB image separately. The individual histogram for each color channels (YCbCr) were calculated and plotted. The three individual histogram were combined into one histogram using concatenation. Then the Chi-squared distance between two original images and between the original image and fake image (test mage) were calculated. If the chi-squared distance between the original and test image is less or greater than value between the two original image and it will display it is a fake image (or) else it will conclude it as real image. We discuss the main tendency of each algorithm with their application, advantages and disadvantages.

I. INTRODUCTION

Medical Images play a major role in analyzing the abnormalities in human body. Due to the advancement of imaging techniques in medical field, so many diseases are identified in its earlier stages. Identifying and analyzing the abnormalities are done through various Image Processing Techniques. Varieties of specialized hardware devices, i.e., Scanners are widely used in capturing such images. The different types of Medical imaging devices and Image formats obtained using such devices are discussed. Images of the human body used for Medical Diagnosis are called Medical Images. Medical Imaging is a technique used to process images of the human body for clinical purposes. The methodology of producing a medical image by radiographic techniques

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is called Medical Imaging Most of the telemedical applications use any one of the following two available technologies.

1. The Store and Forward technology transfers digital images from one location to another.

2. The two-way Interactive Television (IATV).

The term Digital Image Processing generally refers to the processing of a two-dimensional picture by a digital computer i.e., altering an existing image in the desired manner. For example, this processing may remove noise, improve the contrast of the image, remove blurring caused by movement of the camera during image acquisition, it may correct for geometrical distortions caused by the lens. Before going for image processing image enhancement is necessary. We will not be considering every image processing and enhancement technique in this section but we will see the enhancement of image through image histogram or better way histogram equalization. If an image is low contrast and dark, we wish to improve its contrast and brightness. The histogram equalization improves all parts of the image when the original image is irregularly illuminated. The enhancement techniques are employed in order to increase the contrast of an image. Therefore, the distinction of features in the scene canbe easily performed by visualization. This will augment the efficiency of image classification and interpretation.

II. RELATED WORK

Medical images are one of the fundamental images, because they are used in more sensitive field which is a medical field. Identification of biological features and the segmentation is done more accurate by applying the artificial intelligence methods. Consequently these methods are so valuable in Medical Image Segmentation. The segmentation methods depend on many factors like disease type and image features. These factors result in remain the segmentation challengeable and lead to increasing the growth of the number of literatures in this field. Categorization of the literatures can help the researchers to understand more easily and rapidly. There are only a few classifications of the papers which none of them considers intelligent methods. In this paper, the applications of AI in medical image segmentation is mentioned first and then a novel categorization is proposed related to the most recent important literatures in four sets based on applying the AI techniques and decreasing human intervention. Available tools are mentioned and classified based on modality and its application finally.

III. PROPOSED METHOD

In this paper we are going to propose a novel and appealing approach for detecting face spoofing using a color texture analysis is proposed. Introducing a novel and appealing approach using color texture analysis and demonstrate that the chroma component can be very useful in discriminating fake faces from genuine ones. We exploit the joint color texture information from the luminance and the chrominance channels by extracting complementary low-level feature descriptions from different color spaces. More specifically, the feature histograms are computed over each image band separately. Fortunately, the color reproduction (gamut) of different display media, e.g. photographs, video displays and masks, is limited compared to genuine faces. Thus, the presented fake faces suffer from spoofing medium dependent color. In addition, gamut mapping functions are typically required in order to preserve colour perception properties across different output devices, e.g. printer or video display, which can alter the (color) texture of the original image. In this present work, we aim to

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investigate the effectiveness of different texture descriptors more closely in detecting various kinds of face spoofs by extracting holistic face representations from luminance and chrominance images in different color spaces. The texture descriptors originally designed for grayscale images can be applied on color images by combining the features extracted from different color channels. The YCbCr space separates the RGB components into luminance (Y), chrominance blue (Cb) and chrominance red (Cr). It is worth noting that the representation of chroma components in HSV and YCbCr spaces is different, thus they can provide complementary facial color texture descriptions for spoofing detection.

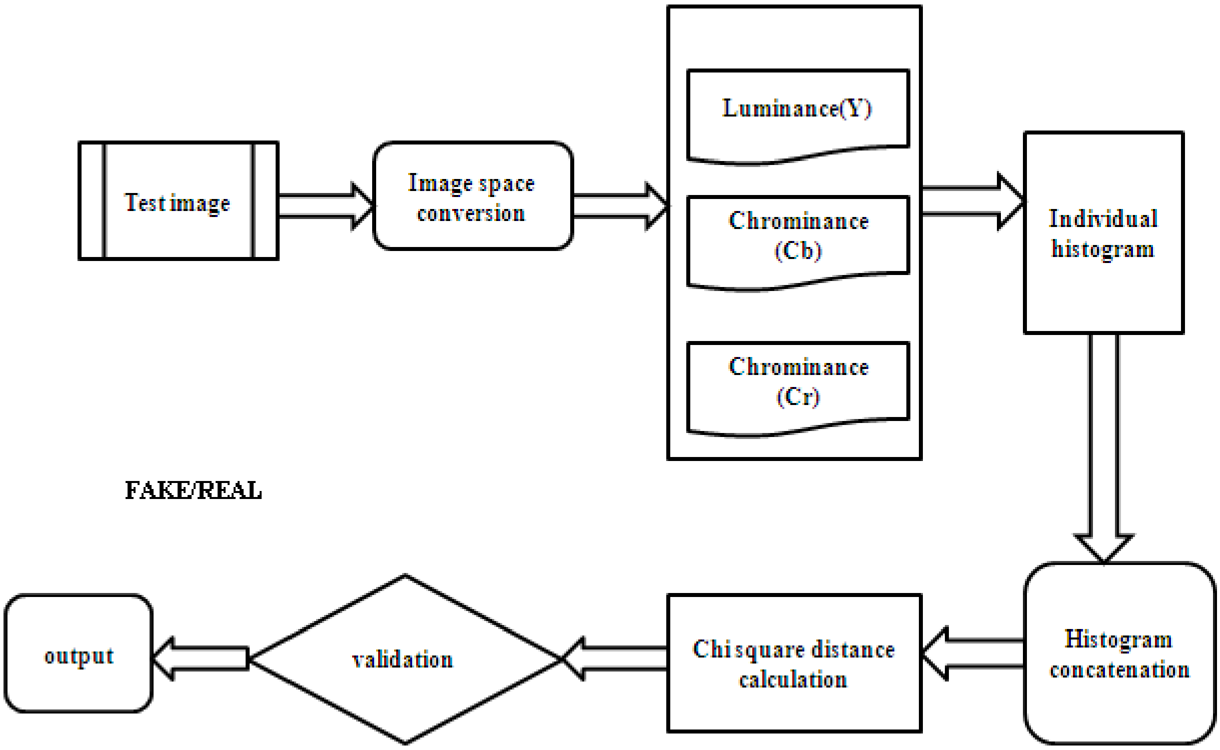

Fig-1: Flow Chart of Proposed Work

The chi-square test is a statistical test that can be used to determine whether observed frequencies are significantly different from expected frequencies. For 13 example, after we calculated expected frequencies for different allonyms‟ in the HARDY-WEINBERG module we would use a chi-square test to compare the observed and expected frequencies and determine whether there is a statistically significant difference between the two. As in other statistical tests, we begin by stating a null hypothesis (H0: there is no significant difference between observed and expected frequencies) and an alternative hypothesis (H1: there is a significant difference). Based on the outcome of the chi-square test we will either reject or fail to reject the null hypothesis.

Chi-square tests enable us to compare observed and expected frequencies objectively, since it is not always possible to tell just by looking at them whether they are "different enough" to be considered statistically significant. A chi-squared test, also written as $\chi 2$ test, is any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Chi-squared tests are often constructed from a sum of squared errors, or through the sample variance.

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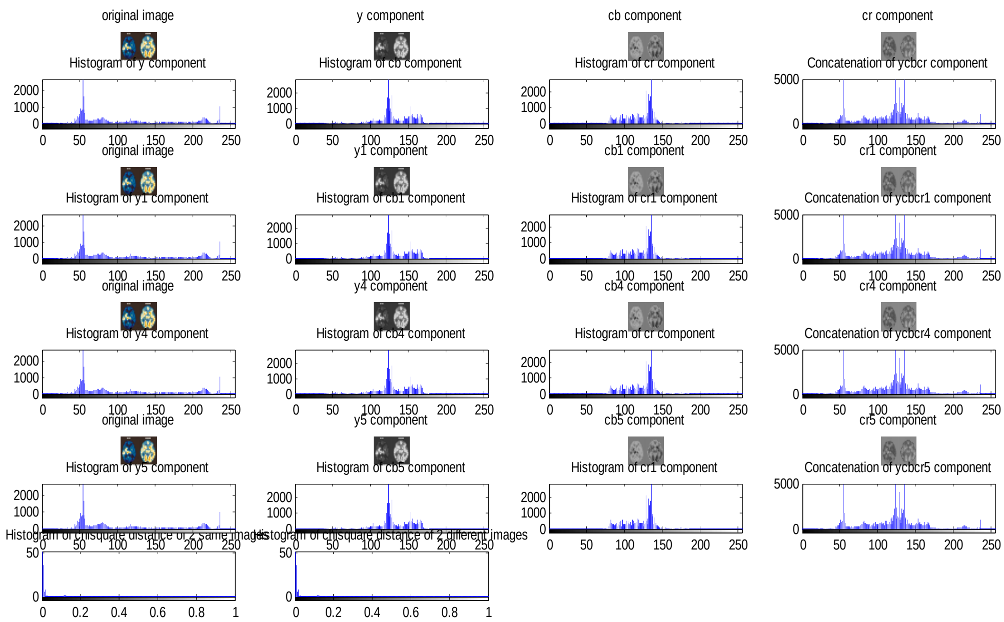
Test statistics that follow a chi-squared distribution arise from an assumption of independent normally distributed data, which is valid in many cases due to the central limit theorem . Also considered a chi-squared test is a test in which this is asymptotically true, meaning that the sampling distribution (if the null hypothesis is true) can be made to approximate a chi-squared distribution as closely as desired by making the sample size large enough. The chi-squared test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.

The Chi Square Distribution The chi square distribution is a theoretical or mathematical distribution which has wide applicability in statistical work. The term chi square‟ (pronounced with a hard ch‟) is used because the Greek letter χ is used to define this distribution. An example of the chi squared distribution is given in Figure 1 Along the horizontal axis is the χ 2 value. The minimum possible value for a χ 2 variable is 0, but there is no maximum value. d (x,y)=sum((xi-yi) ^2/(xi+yi))/2 The vertical axis is the probability, or probability density, associated with each value of χ 2. The curve reaches a peak not far above 0, and then declines slowly as the χ 2 value increases, so that the curve is asymmetric. As with the distributions introduced earlier, as larger χ 2 values are obtained, the curve is asymptotic to the horizontal axis, always approaching it, but ever quite touching the axis. Each χ 2 distribution has a degree of freedom C1=c1/size (I1, 1)/Size (I1, 2); C2=C2/Size (I2, 1)/Size (I2, 2); Appendix The χ 2 distribution for 5 degrees of freedom is given in Figure 10.1. The total area under the whole χ 2 curve is equal to 1. 15

The chi-squared distribution has numerous applications in inferential statistics, for instance in chi-squared tests and in estimating variances. It enters the problem of estimating the mean of a normally distributed population and the problem of estimating the slope of a regression line via its role in Student’s t-distribution.

IV. IMPLEMENTATION AND RESULTS



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	PSNR	MSE	RPE
Original Gray Scale Image			
Existing Work	**71.4395**	**0.00376**	**233.0000**
Proposed work	**92.5792**	**4.502e-27**	**2.9634e-22**
Blue Chrominance Image			
Existing Work	**73.8343**	**0.0020**	**130.0000**
Proposed work	**91.2552**	**5.1314e-27**	**5.0183e-22**
Red Chrominance Image			
Existing Work	**74.5637**	**0.0023**	**149.0000**
Proposed work	**87.7741**	**5.8497e-27**	**5.4890e-22**

V. CONCLUSION

In this paper anti-spoofing from the medical texture point of view is computed. The different color image representation(y Cb C r) is used for discriminating the fake faces from genuine ones. In future we will use local binary pattern (LBP) method for the problem for more accuracy, more number of datasets using database. Presented a novel histogram preservation mode for texture-enhanced image denoising, and further introduce two region-based. A simple but theoretically solid model and the associated algorithm were presented to estimate the reference gradient histogram from the noisy image, and an efficient iterative histogram specification algorithm was developed to implement the histogram model. By pushing the gradient histogram of the denoised image toward the reference histogram achieves promising results in enhancing the texture structure while removing random noise. HP leads to similar PSNR/SSIM measures to the state-of-the-art denoising methods such as SAPCA- BM3D, LSSC and NCSR; however, it leads to more natural and visually pleasant denoising results by better preserving the image texture areas. Most of the state-of-the-art denoising algorithms are based on the local sparsity and nonlocal self- similarity priors of natural images. It would be interesting and valuable to study more general models and algorithms for non-additive noise removal with texture enhancement. Evolution of Medical

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Imaging has been critical to Medical Research. Without Medical Imaging, nothing would be known about the human body or issues surrounding it. In this paper, the various Medical Imaging technologies such as X-Ray, Computer Tomography and MRI scans, Medical Image formats especially about DICOM have been briefly discussed.

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