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Fabric Deconvolution Wiener Filter With Smoothness Feature Extraction For Projecting Directional Defects

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ABSTRACT

The system provides a Standard for fabric defect Detection System using Four Point Grading System. This Four point Grading System is an international standard used by Textile Industry. The proposed system uses Deconvolution wiener filter for the purpose to denoise the images. The images are binarized and segmented using thresholding by separating the pixel values based on intensity level which is either one or zero. After that Deconvolution wiener filter is used to diminish the noise in images while attempting to restore the original signal. This filter which works in the frequency domain is used to denoise the images. Taken together the process segmentation and filtration to get the pre-result image. Finally, the morphological operations both erosion and dilation are done for adjusting the neighborhood pixel values. The combination of erosion and dilation operations is used based on shapes. The features are extracted using region props functions. Then the classification is done with accurate results. The images used in the proposed system are from TILDA's Texture dataset.

Keywords: Fabric, Defect, Detection, Image Processing, Deconvolution wiener Filter, TILDA.

1. INRODUCTION

Generally in the textile industry fabric inspection are done by humans, it is a time-consuming process, and it's very expensive too. The manual inspection of fabric has a lot of problems. The first problem is human inspectors feel bored and tired. Secondly as said above, the cost is high. Thirdly, not able to find the defect correctly. There may be a chance of the wrong

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detection of defective fabric. These problems are sort out using the automated detection system for defects. The quality inspector can able to discover almost 200 defects in one hour. If the detection speed increases then the accuracy of detection will be decreased to some percentage. Since we need detection accuracy and detection speed. Our best choice is to go for automation. There are many existing algorithms used by researchers for the fabric defect detection technique. Even then the detection accuracy rate is low. Since we need an algorithm with good efficacy and detection accuracy. So, that the new algorithm is proposed For all of those above-mentioned reasons automatic fabric detection system is proposed. One such system is discussed here with various image processing techniques. In the proposed system which uses a Deconvolution wiener filter to denoise, the image is a chief technique embossed here. The preprocessing is done with the given image and the output results are driven. The textile manufacturer needs a reduction in cost and to give up a good quality of fabric to the supplier. The supplier needs a high-quality garment. This is in the hand of manufacturers, they depend upon quality inspectors.so to reduce the intervention of humans the computer vision system is in need. Not only to reduce the intervention but also to reduce cost and to produce high-quality fabric.

Li et al propose a system using bi-dimensional empirical mode decomposition. They used an intrinsic mode and stopping criterion function. It divides an image with two-dimensional signals with instantaneous local frequency [1].

Mohammed et al developed a system using minimum error thresholding and entropy filter. The estimated threshold using minimum error thresholding and filtered an image using entropy filtering. The morphological operation too used to remove the unnecessary regions [2]. G. Liu and X. Zheng propose a method with entropy and Saliency features to identify the patterned fabric defects. The author constructed a quaternion matrix by adding a 2dimensional entropy value with a saliency map. Form an Hyper complex Fourier transform and use Gaussian filter also from an inverse hyper complex Fourier transform to obtain saliency map [3]. LI et al developed a method with a saliency map for fabric defect detection using histogram features. The author generated the saliency map to differentiate the defective and defect-free image. Next, the saliency histogram features are extracted. Then the two-class support vector machine classifiers are used to train the image and testing is done [4]. Jing et.al recommends a method for defect detection using a deep convolution neural network. The author divides the images into patches and labeled. Then the labeled patches are sent to deep convolution neural networks. At last, the defects are identified by training the image [5].

In the previous work, the authors only detected and classified the image. No authors suggested working with four point grading system. This is an international standard followed by the textile industry. Using this standard only the quality inspector will finalize whether the fabric is goods quality or not. Based on that the fabric is used by the textile industry for the next garment manufacturing process. The fabric defect is identified by segmenting the defected region. Next, the classification was done to categorize the fabrics. The different

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categories are Holes, oil stains, missing threads, foreign objects, creases in fabric, changed lighting condition,

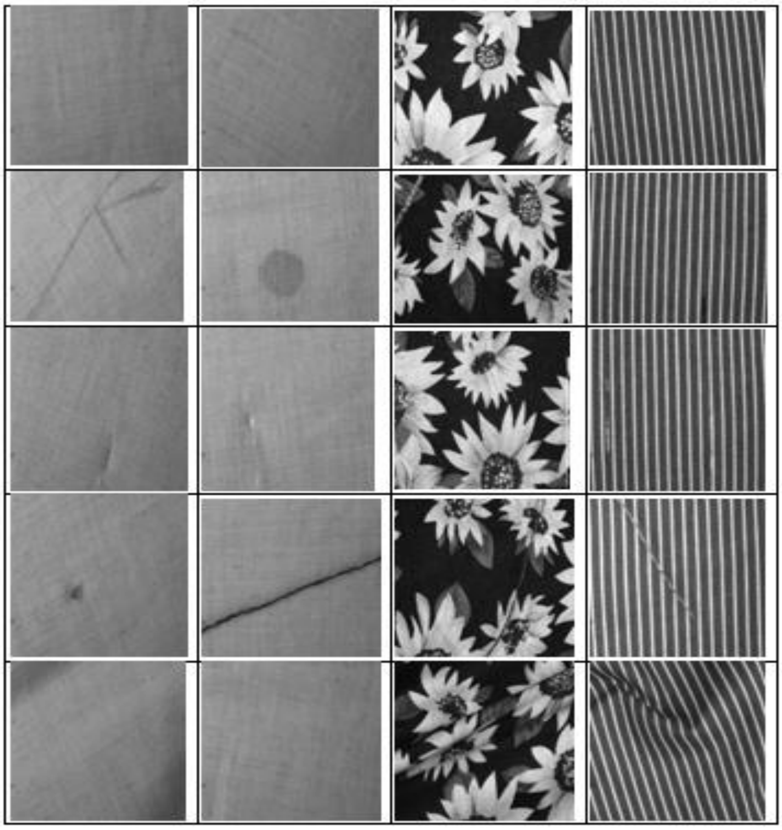

Fig 3.1 Sample images from TILDA dataset

affine distortion by camera skew. These are all the usual defects find in fabrics and also given for reference in fig.1.1Types of defects. These images are acquired from the TILDA texture dataset which contains 1400 images [8]. From that the plain fabric of 350 images are used in which the first fifty images are defect-free image then the next three hundred images are defective. Out of that 300 images, each of fifty images is categorized as the abovesaid categories. The remaining 1100 images are textured patterned images in the TILDA texture dataset. The images are with 512*768 pixels. The Matlab R2017b was hand-me-down to develop and implement a detection method and also for performance evaluation.
The Fabric defect system components are camera selection, Lens selection, Light selection, Frame grabber [8]. The standard fabric images are very challenging to get from an on- loom fabric. The camera selection is a big task. In general two varieties of a camera are present here. The one is Area scan and the other is Line Scan cameras. The line scan camera catch images in the custom of lines at very extraordinary speed from fabric. The encoder is used in order to harmonize the images in the running fabric. In order to acquire the original movement of fabric the application used here was a camera-encoder interface. This

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contributes exactly initiating for line scan camera. If the images are taken from the moving fabric it looks blur. Instead, the images are taken from non-moving fabric it is very clear.

Line scan cameras are chosen for high-speed objects in order to eradicate the fuzziness in the image. From the above analysis, the line scan cameras are used for moving fabric and the area scan cameras are used for non-moving fabric. The next stage is lens selection. A suitable lens selection is needed for defect detection. The field of vision and range to see are decided with the camera used. Therefore the lens is chosen from the size of the sensor, field of vision, and working distance. The image size, figure, and clearness are formed by means of lens selection. So that focal length f vale should be calculated. The F can be formulated as below.

$$F=C/H *g \quad (1)$$

Here C is the image size, H is the object size and g is the object distance. FFL (fixed focal length) values are fixed for each and every lens. The equalizing f2<=FFL<=f+2 is used for calculating the f and FFL values which are in between for lenses. The selection of lenses can be done by a web-based application [10].To get an optimal image quality the researcher should consider the magnification factor. The magnification factor should be >1:10. That is sensor size should be one and object size should be ten.

The succeeding process is light selection. For image acquisition and machine vision applications, lighting is the problem factor. The lighting schemes used for automatic fabric systems are front, fibre-optic, back and structural lighting techniques [11]. In general Frontlighting techniques are used for dense fabric Inspection and the camera is situated in front of the camera in the same location. For larger fabrics, the fibre-optic technique is not used. In the semi-transparent fabric structure, backlighting techniques are used. It eliminates the ghostlike effect. The structure lighting system is used to differentiate the defected and defect-less image using infrared light. The high frame rate camera is used for this purpose. The light sources used are LED (Light-emitting Diode), halogen lighting, and fluorescent lamps.

To capture quality images the width of light is necessary. In order to select the optimal width of light, the following formula is used.

$$W\,(mm) = A + (2*D) \quad (2)$$

W is the width of light, A is the illuminated area and D is the camera working distance. In order to acquire a good machine vision line LED lighting is used. The lighting quality is like the human eye provided by LED lighting. The above formula is used to select the width of light through which LED lighting can be used. The wavelength range is radiation in the middle of 400 -700 nm for the human eye in the electromagnetic spectrum. The next component is Frame Grabber. To transfer the data in the middle of the camera and data processing unit is the purpose of the frame grabber. The data should be stored and delivered quickly so that data are transferred in the middle of the camera and data processing. Frame grabbers are in need to use the high-speed line camera for detecting the defects in the fabric.

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If the frame grabber is not available the camera data are lost accordingly. By means of a frame grabber, more than one camera data can be transferred to the system of a computer.

2. METHODOLOGY

The images are acquired from the TILDA Texture dataset. The acquired images are fed into a deconvolution wiener filter. The Wiener filter is the combined performance of inverse filtering and noise smoothing. This is a restoration technique used for image smoothening. Inverse filtering means it inverts the blurred image to the original image. The image smoothening means it removes the additive noise. It reduces the mean square error in the process of wiener filtering. It does both high pass filtering and low pass filtering. High pass filtering is the inverse filtering and low pass filtering is the noise removal technique with compression operation. The Stochastic framework is used in the Wiener filter. The estimation of power spectra and additive noise is needed for implementing the Wiener filter. The periodogram estimate of the power spectrum is figured from observation. This cascaded implementation is calculated using inverse filtering and noise smoothing. Then low pass filter is used to blur the image. The additive noise is given with variance for the blurred image. Both inverse filtering and noise removal are used. The image is restored using a Wiener filter with the least mean square error. PSF is the point source of an imaging system for impulse response. It is represented as a blob in an image and it is a single point object. It is used to measure the quality of an image by blurring the point object to a certain degree. The non-coherent system follows the linear system theory. When two objects are imaged simultaneously the result is an independent object's sum.

$$I\,(O1+O2) = I\,(O1) + I\,(O2) \qquad (3)$$

Generally, the PSF can be derived as the convolution of PSF and object which gives the convoluted image. In a space in-variant system, the PSF value will not be changed in the space of an image. With the deconvolution of PSF and the image, the image features are enhanced and the noise is removed from the image [13]. If the object is divided with varying intensity of discrete point, the image can be calculated as the sum of PSF point. The PSF can be calculated using a microscope, telescope, or some other imaging system. The description of the entire image can be identified by knowing the optical properties of an image. By means of a convolution equation, the imaging process is done.

The PSF (point spread function) values are used in the Wiener filter. The above images refer fig 3.1 are from the TILDA texture dataset used for defect detection purposes. The first row of images is defect-free images. The next set is mechanically induced holes and cut defects. The third set is oil stain and color defect. The fourth set of fabric is thread defect or missing threads. The fifth set of fabric is foreign objects in fabric. The sixth set of fabric is creases in the fabric and here it was not a mechanical defect. The Fig 3.3 refers Schematic Diagram of the Proposed System. The image preprocessing is done using these filters. This wiener filter is used to minimize the mean square error through which the original image and filtered image are compared to get a good sharp image.

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$$MSE = |I\text{-}IF|2 \quad (4)$$

The mean square error is the difference between the original and filtered image with squaring. Here the variable I is the original image and IF is the deconvolution wiener filtered image and squaring the terms we get a mean square error.

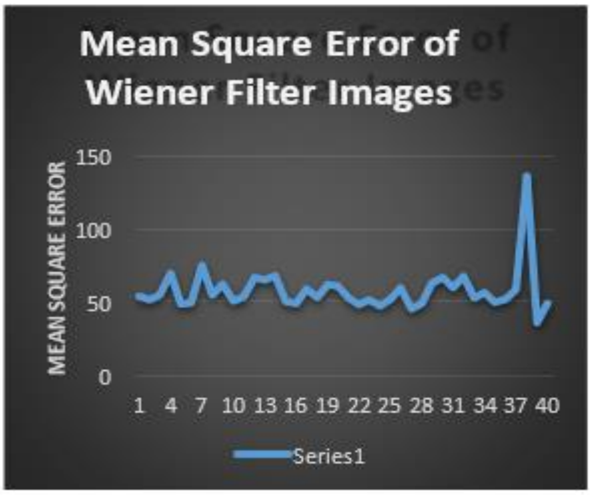

Fig.3.2 MSE of Deconvolution Wiener filter Images

In the Fig 3.2 gives the non-zero value for all images from that we can understand the images used here for further processing are in high standard.

Here it selects different threshold values of its neighbourhood pixels through analysis. The filtering output is given as the input for the next thresholding stage. Then binarize the image for converting the Gray-scale image into a binary image. The morphological operation is done for extracting the output. The pixel in the image is adjusted by comparing it with the neighbourhood pixel. The contours are extracted from the image for purpose of segmentation.

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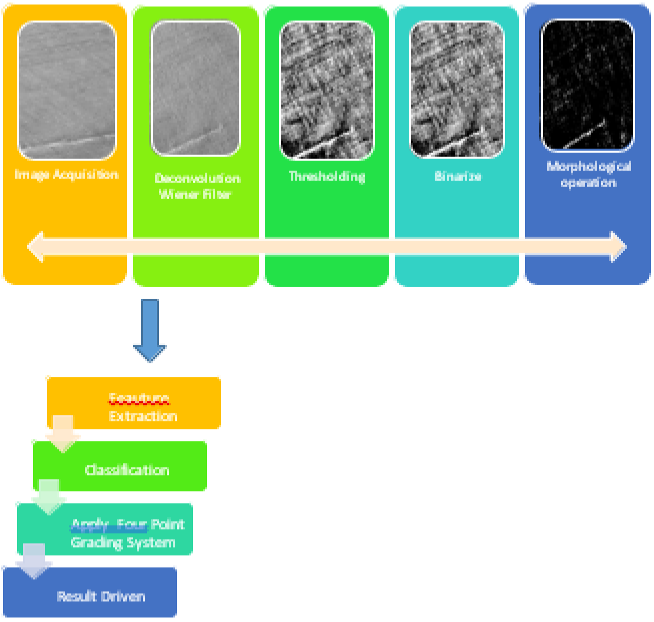

Fig.3.3. Schematic diagram of proposed system

By all means here in the proposed system the author is using together both the erosion and dilation for reconstructing the shapes. These erosion and dilation operations are used for both expanding and shrinking the segmented object to get the resultant output. The Segmentation is done for the purpose of selecting the defective portion and based on that the morphological operation is done. Through this operation, the neighboring pixels are adjusted.

3. EXPERIMENTAL RESULTS

The right first step in the proposed method is image acquisition and as said already the images are got from the TILDA texture dataset. Each and every step in the image acquisition produce changes in the pixel value in the resultant image which is called noise. In order to remove the noise, some filtering techniques are used. Here we have used the deconvolution wiener filter. At most the deconvolution wiener filter in which unwanted noises are removed. By applying motion blur we get the foggy image. After that, we apply a deconvolution wiener filter to get a filtered image.

It is an image restoration technique that was used in the proposed method for denoising. The output for the Wiener filtered image was given in Fig.4.1. The image was filtered with a known PSF value.

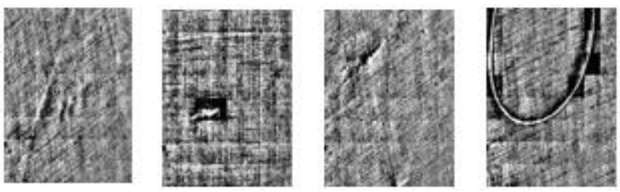

Fig.4.1 Deconvolution Wiener Filtered Images

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After local thresholding, the output obtained is shown in Fig 2.4. The purpose of thresholding is to segment the image to get the desired output. Here the author has used local thresholding for the proposed system. The local thresholding concentrates more on the foreground image. So it is easier to segment the image with more clarity. Since we need more preference on local contrast in this detection system. And we no more need a global contrast, we put emphasis on local contrast which leads to the use of local thresholding.

$$B = \begin{cases} 1 & if\ F(x, y) > T(x, y) \\ 0 & \text{Otherwise.} \end{cases} \quad (5)$$

1

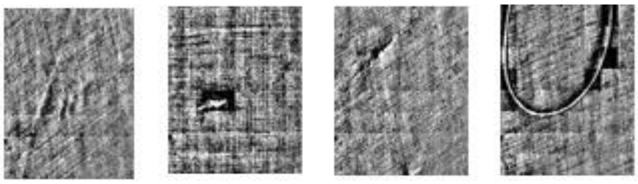

Fig.4.2 Thresholded Images

The subsequent process is converting the image into a binary image refer to Fig.4.2. Before going into the process of binarization. We should threshold the image for finding the threshold value of the previous grayscale image and also to find whether it's having a specific value or not. In this proposed system the Gray-scale thresholded image is converted into a black and white image. The process binarization is done by considering the pixel value with luminance greater than 1 are converted to 1 others are converted to 0.simply we get an image with only black and white pixels. If the given image is not a Gray-scale image then it first converts the image to a Gray-scale image and then it is converted to a binary image refer Fig.4.3. In the proposed system we have used a TILDA dataset which contains Gray-scale images only.

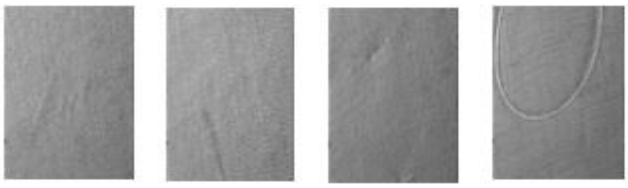

Fig.4.3 Binarized Images

The morphological operation is done as the next succeeding steps. The morphology having four kinds of operation. Opening, closing, expansion, erosion [12]. The expansion makes the pixel increase. Erosion reduces the goal pixel. Erosion shrinks the image border into an internal field. It has a definite role to reject boundaries. In the opening, the first operation is erosion the next operation is Expand. On the other side first expansion then erosion takes place for closing.

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The noise in the defected region makes defect exclusion in the remote points when we do segmentations in the fabric which results in poor detection accuracy. Here the noises are removed using a deconvolution wiener filter and Mean square errors are calculated to show the image standard. In order to eliminate noise interference, we should improve the morphological structure. The two operations are used simultaneously which is opening smooth image holes and remove the unwanted pixels. The opening sharpens the image border simultaneously.

In contrast, Closing fills the holes and cracks. In order to get a good result, the two operations are combined. Depending on the characteristic of defected image the erosion is applied for a defected image vertically, horizontally, or to the background pixels. Then the corresponding pixels are removed. The next operation expansion is done for restoring the target pixels. Here the Erosion removes unwanted pixels on boundaries and also it is like computing the local minimum value over the area. It also increases the size and sharpens the edges as in Fig.4.4

In contrast, Closing fills the holes and cracks. In order to get a good result, the two operations are combined. Depending on the characteristic of defected image the erosion is applied for a defected image vertically, horizontally, or to the background pixels. Then the corresponding pixels are removed. The next operation expansion is done for restoring the target pixels.

Here the Erosion removes unwanted pixels on boundaries and also it is like computing the local minimum value over the area. It also increases the size and sharpens the edges as in Fig.3.6.

1. Given with original image A and structuring element B 2 Initialize a new image c of size A with zeros.
3. Construct a window and compare the original image A.
4. Check whether the ones in structuring element B overlap ones in the window.
5. If it overlaps set a new resultant image with one or else set the resultant image with zero value.

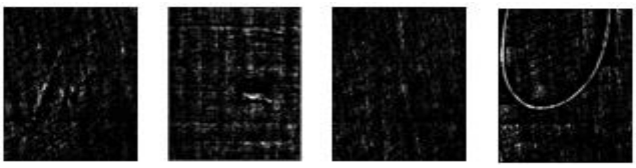

Fig.4.4 Erosion output

The area opening is done to remove the connected components which are lesser than the original pixel value. Then the dilation is applied to expand the holes. This morphological operation will make the holes very thicker as in Fig.4.5.

1. Given with original image A and the structuring element B
2. Pad the original image with all sides zeros i.e. C
3. Now perform AND operation of C and B
4. Get the Result

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Fig.4.5 Dilation output and final result

Finally, the feature Extraction and classifications are done.The holes can be identified using the below algorithm. The default is the presence of holes in the fabric and the indicator is the Existence of voids in the image [14]. The presence of a void area should be evaluated. Firstly, read the resultant binary image. The percentage of white pixels should be computed for the entire image. The Binary image should be divided into several sections. Then for each and every section, the percentage of the white pixel should be calculated. Finally, sort the rate of white pixel for each section and select the value with maximum rate. Apply this algorithm for the sample of the database having defects. The high values are shown for the Hole defect. Using this value we can identify the Hole defect and apply the four point grading system standard. After applying this standard the fabric acceptance can be decided. Depending on that the acceptance and rejection of fabric can be decided. If the void area is smaller from that we conclude that it is a pinhole defect.

5. RESULT AND DISCUSSION

Here in this result, the author discussed whether to accept or reject the fabric. The fabric is accepted or rejected based on Table-I. The sample of 19 fabric results is given in the tabulation. In the tabulation, the fields given are Filename, Area, Inches, Point, and Result. Then the area has been calculated using Regionprops function. The Regionprops are used to measure the properties of image regions. The hole defect alone is identified since that is needed for four point grading system. The hole is identified by counting the number of white pixels in an image. The fabric is rejected if there is a hole defect even the size of the defect is below the mentioned range i.e. below 9 inches. Here in the second row with the filename c1r1e1n44.tif, area 1492 and is rejected even the defect size is 4.9 inch the fabric because it is Hole refer Table-I. The features are extracted using Regionprops. The properties extracted are area, smoothness, etc.

Table- I: Feature Extraction and Analysis using Regionprops

Filename	Area	Inches	Point	Result
c1r1e1n40.tif	3392	11.30667	4	Rejected
c1r1e1n44.tif	1492	4.973333	2	Rejected
c1r1e1n47.tif	3766	12.66	4	Rejected
c1r1e3n6.tif	2191	7.303333	3	Accepted
c1r1e4n10.tif	55699	185.6633	4	Rejected

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c1r1e4n34.tif	2950	9.833333	4	Rejected
c1r1e4n35.tif	2237	7.456667	3	Accepted
c1r1e4n37.tif	17629	58.76333	4	Rejected
c1r1e4n43.tif	2323	7.743333	3	Accepted
c1r1e4n45.tif	1448	4.826667	2	Accepted
c1r1e4n49.tif	16827	56.09	4	Rejected
c1r1e4n6.tif	44751	149.17	4	Rejected
c1r1e4n7.tif	6187	20.62333	4	Rejected
c1r1e4n9.tif	32029	106.7633	4	Rejected
c1r1e5n34.tif	1840	6.133333	3	Accepted
c1r1e5n39.tif	9930	33.1	4	Rejected
c1r1e7n32.tif	1203	4.01	2	Accepted
c1r1e7n41.tif	1712	5.706667	2	Accepted
c1r1e7n42.tif	1206	4.02	2	Accepted

Here in these sample images, the area has been converted to inches for the purpose to calculate the points. The points are used here to express as an international standard system of four point grading system. Based on this system we calculated the points and further decided whether to accept or reject the fabric. Fig 5.1 gives the size of the defective image. The area value is small we conclude that it is a small size defect. If the area value is large then the size of the defect is large. This is meant for the only directional defect. The only defects identified are directional. The feature extraction and classification is the difficult and challenging one for un-directional defects but it is possible for a directional defect in images.

The Below figures Fig.5.2 gives the smoothness of each and every sample image. Here if the smoothness value exceeds above 0.9996 the particular sample images are rejected. And if the value equals to and below 0.9996 the corresponding samples are accepted. The performance can be evaluated by pinpointing the defects. The defects are identified with help of detecting white pixels in the binary image. If the white pixels are not seen in the resultant binary image. The author can conclude that there is no defect in the resultant binary image. Sometimes even the defects are not present in the resultant binary image there is a white pixel in an image because of misdetection. These things should be evaluated and analyzed in the proposed system. Totally 350 images are fed into the proposed system from the TILDA dataset. Out of that 335 images are identified with the correct output. The remaining 15 images are giving false alarm which means the white pixel is shown but the location is not correct. The true detection is recorded when the white pixel is correctly detected without any error and also the

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location of the defect should be detected exactly. The overall Detection is the total of false alarm and true detection. Here the overall detection is 350 images.

The performance for the four point grading system is with the high standard it correctly classifies the acceptance and rejection refer the Table-I Feature Extraction and Analysis.

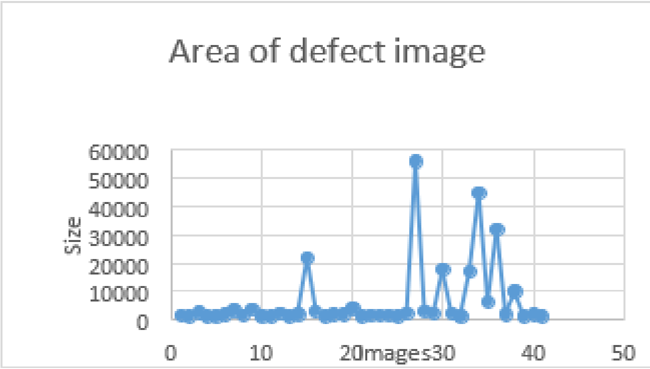

Fig.5.1 Defect size

The 19 image samples are given for this system. And the system able to identify whether the fabric is accepted are rejected. In the 19 samples, only 8 fabrics are accepted and the remaining 11 fabrics are rejected. The acceptance and rejection are based on the four point grading system international standard. The 8 fabrics are having minimum defects so that fabric should be considered for acceptance. The remaining 11 fabrics are with a larger defect. So that fabrics are not accepted.

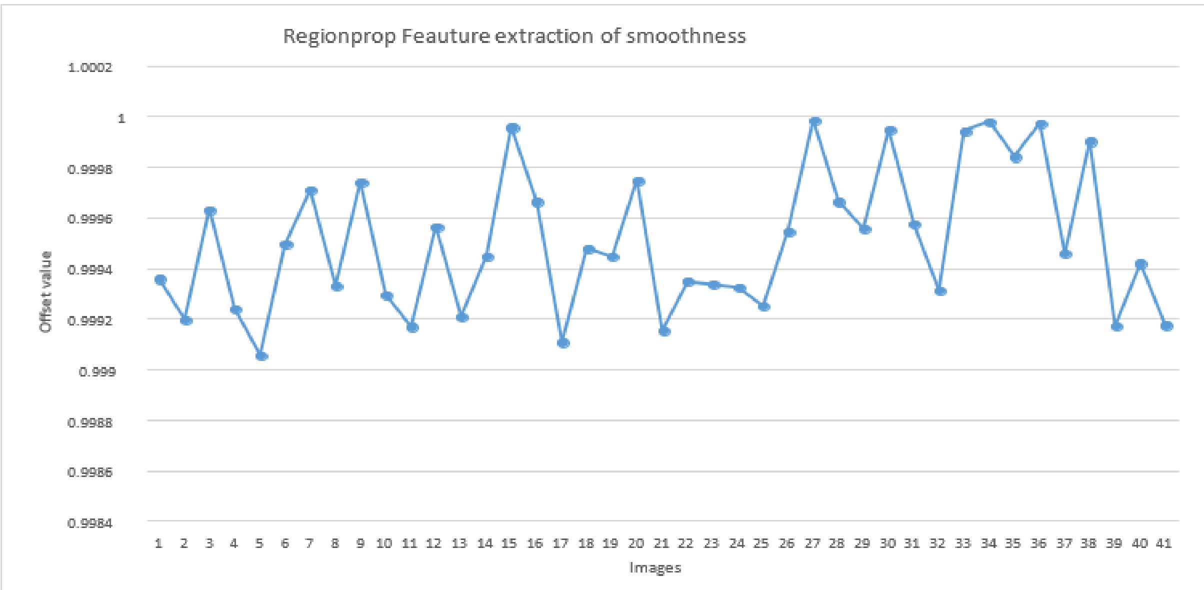

Fig.5.2 Feature Extraction of smoothness

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Table- II: Four point grading system [9].

Defect length	Penalty points
Up to 3 inches	1
3-6 inches	2
6-9 inches	3
Over 9 inches	4
Hole and opening (I inch or less)	2
Hole and opening (over 1 inch)	4

Depending on the defect length the points are calculated. And if the inches that the defect length is up to 3 inches then 1 point is assigned. If the inches are from 3 to 6 then 2 points are assigned and if the inches are from 6 to 9 inches then 3 points are assigned and if the inches are above 9 inches 4 points are assigned refer to Table II. If the hole and opening present with 1 inch or less then the penalty point is assigned with a value of 2 and if the hole and opening present over 1 inch the penalty point is assigned with value 4. Another rule here which the fabric Inspector will use is given. That is total defect point per 100 square Yards should not be greater than 40 points of penalty. The Yard is nothing but a measuring unit of fabric used by the garment industry. The fabric which contains more than 40 penalty points is represented as "seconds". The manufacturing unit will not use this fabric for further processing. The fabric will go to the next stage that is for making garments.

6. CONCLUSION

The author concluded the "Four point grading system using deconvolution technique for fabric defect detection system"by means of identifying the defect length using the Regionprop function. This proposed system is a very useful technique and can be followed in any industry for accepting the fabric. The main proposal of this system is doing an inspection in the industry regarding the quality of the fabric. In the end, the main aim of this inspection should be either the resultant fabric should be accepted or rejected using four point grading international standard. The quality can be achieved using this proposed system. The challenging task here is not able to identify the area of Un-directional defects which makes complications for inspection.

A lot of experiments have been carried out to detect fabric defects. Using the proposed system firstly the defect-free 50 images are given as input and checked for any misdetection. But fortunately, the proposed system gives favorable output. Then succeeding gave a 300 defected image and result was very amazing. The proposed system found a correct result for 285 images.

The Accuracy rate for the proposed system is 95.7. The accuracy rate for the second phase is four point grading system that classifies the acceptance and rejection of fabric sent to the manufacturing unit for further processing. The overall result gives less false alarm rate and a

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high defect detection rate. Finally, it gave good results for both in efficiency and accuracy of detection for resultant fabric in the proposed system.

7. REFERENCES

1. J. L. a. W. G. Zhengxin Li, "Fabric defect segmentation by bidimensional empirical mode decomposition," 2014.
2. M. S.Sayed, "Robust Fabric Defect Detection Algorithm using Entropy Filtering and Minimum Error Thresholding," in IEEE, AbuDhabi,UAE, 2016.
3. X. Z. Guohua Liu, "Fabric Defect Detection based on information entropy and frequency domain Saliency," 2021.
4. S. W. D. W. Min Li, "Fabric defect detection based on saliency histogram feautures," vol. 35, no. 3, 07April2019.
5. H. M.-H. Z. Jun-Feng Jing, "Automatic fabric defect detection using a deep convolution neural network," vol. 135, no. 3, March2019.
6. P.R.Tamilselvi, P.Banumathi, "Fabric Deconvolution Wiener Filter and Feature Extraction Regionprops For Locating Defects," vol. 8, no. 3, 2019.
7. [7]HYPERLIN"https://www.owlnet.rice.edu/~elec539/Projects99/BACH/proj2/wiener.html"https://www.owlnet.rice.edu/~elec539/Projects99/BACH/proj2/wiener.html
8. https://lmb.informatik.unifreiburg.de/resources/datas ets/tilda.en.html.
9. http://www.indiantextilejournal.com/articles/FAdetail s.asp?id=4664.
10. http://www.baslerweb.com/en/products/cameras/line scan cameras (2016).
11. A.Kumar,Computer vision-based fabric defect detection: a survey,IEEE Trans. Ind. Electron. 55(2008) 348-363
12. F.Wang,G.T.Jiao and Y.Du,"method of Fabric defect detection based on mathematical morphology" Journal of test and measurement technology,Vol.21,pp.515-518,2007
13. https://en.wikipedia.org/wiki/Point_spread_function
14. M.Jmali,B.Zitouni and F.Sakli,"Fabrics defects detecting using image processing and neural networks",2014 Information and Communication Technologies Innovation and Application (ICTIA), 2014, pp, 16, doi:10.1109 / ICTIA.2014.7883765.

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