An Automatic Method to Inspect Discontinuities in Textile

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Abstract-A fabric defect is any abnormality in the fabric that hinders its acceptability by the consumer. Quality assurance of textile materials depends on the quality of a fabric when it is received as a roll. Even the most outstanding manufacturing methods cannot compensate for defective materials. Presently, the inspection is done manually after a significant amount of fabric is produced. The optimal solution would be to automatically inspect fabric as it is being produced to change process parameters automatically to improve product quality. In this paper, the problem of fabric defect detection using image distance difference algorithm is investigated. The approach is experimented and evaluated with a set of images of fault free and faulty images with satisfactory results. Experimental results confirm the reliable and reasonable defect detection ability of the proposed system.

Keywords- Fabric inspection, image distance difference algorithm, Quality assurance, region prop, threshold.

I.INTRODUCTION

In Textile industries when fabrics are processed, it is very tough to identify the faulty section manually since it requires manual visioning continuously which takes a lot of time. As a result, the textile industry has been moving toward automated fabric inspection. .Fabric detect defection by using digital image processing technology recently is a new hot researching subject. To provide the most precise control of quality, the fabric must be monitored as it is constructed so that corrections can be made immediately to minimize the quantity of poor quality fabric.

The automation of fabric inspection is one of the most intriguing research topics. Each of the inspection system has its own limitations and defect detection is limited to a certain range of defects. Fabric defect detection is still a topic of considerable research and researchers have proposed different algorithm to reduce the cost and improve the throughput and range of detects that can be detected. Jingmiao Zhangm and Linru Li, *"A new algorithm for Fabric Defect Detection Based on Image Distance Difference" ,IEEE Trans.* 2009 Third International Symposium on Intelligent Information Technology Application developed an algorithm which consists of the following defects:-

 1) If there is crease in the fabric, it is quite easy to think the shadow to be the defect by mistake.

 2) As image distance difference arithmetic is based on the gray scale image, the defects of such as blue and red threads may not be judged accurately.

 3) At present, the system is limited in the defects of the pigment fabric; the detection to the fabric whose background is complicated needs more study.

This paper focuses on this problem and proposes an automatic method which will be more identificating and improving. The system will detect the textile defects for RGB as well as for GREYSCALE images.It will work for both homogenous and as well as complicated background textile fabrics.

In this paper it is explained how a faulty fabric image is processed through image distance difference arithmetic.

The research content of fabric defect detection includes image pluck , image processing , arithmetic design ,defect recognition and defect location mark. The image processing subsystem is key. Color image must be processed firstly by image gray scale, and then make subtration with standard gray scale image by which we get different gray scale image. We get binarization image from different gray scale image which pass by image binarization. The binarization image then passes through image processing technique to detect the location of the defects.In this paper it is explained how a faulty fabric image is processed through image distance difference arithmetic.

II.CHARACTERISTICS OF ALGORITHM

This paper mainly focuses on the problem mentioned in the literature and proposes an algorithm which encompasses the following features:-

1. The image distance difference algorithm will identify the flaws more accurately and clearly.
2. The algorithm will detect the textile defects for RGB as well as for GREYSCALE images.
3. It will work for both homogenous and as well as complicated background textile fabrics.

III. GOALS

The main goal of this paper is to detect the discontinuities both online and offline. On the simulation window I have provided two options to take the sample:-
- From computer
- From webcam

Till now 1st goal of detecting the defects in textiles is achieved from computer database and verified successfully. The second option is yet to complete.

IV.IMAGE DISTANCE DIFFERENCE METHOD

The principle of image distance difference method is as follows: if two images coming from the same background, the image distance difference algorithm is the result that one of the two images subtracts the other one, and which reflects

the difference of the two image in colour ,light,texture and frame.In defect detecting, system adopts image distance difference arithmetic,which is to make gray scale image with defects do difference operation with the standard background gray scale image stored in computer. The image difference of the two may be the gray scale image that implies detect. Making use of this arithmetic, we can detect one degree of bright unit difference of gray scale in two images. This arithmetic can be applied to most defect detecting, for all defects being reflected in image which act as image difference.

A distance difference image is still an gray scale image, on which we can not carry on image measuring directly, and can not directly withdraw characteristic. This is because difference image may imply yawp. For example the illumination asymmetry, air current, the fabric oneself thin and thick, the air dust etc, which create yawp, but they aren't

detect. Hence to detect the defects accurately,we need image binarization and to wipe off yawp.

A.Use a sub area threshold method to carry on image binarization for defect distance difference image

The processing of carrying on two-valuezition to the image actually is to carry on district partition to image by using a certain threshold value. All the pixels whose gray degree is big to the certain threshold are regarded as defect, and the others are regarded as background.

The experiment has proved that the different image got by processing defect with dynamic partition not only separates defect from background of the image better,but also is useful for designing the multi-threading arithmetic to speed image two-valuezition processing process. In addition, a blue mark ink spot is applied in the algorithm with which the real location of fabric defect is clearly visible on the surface of fabric.
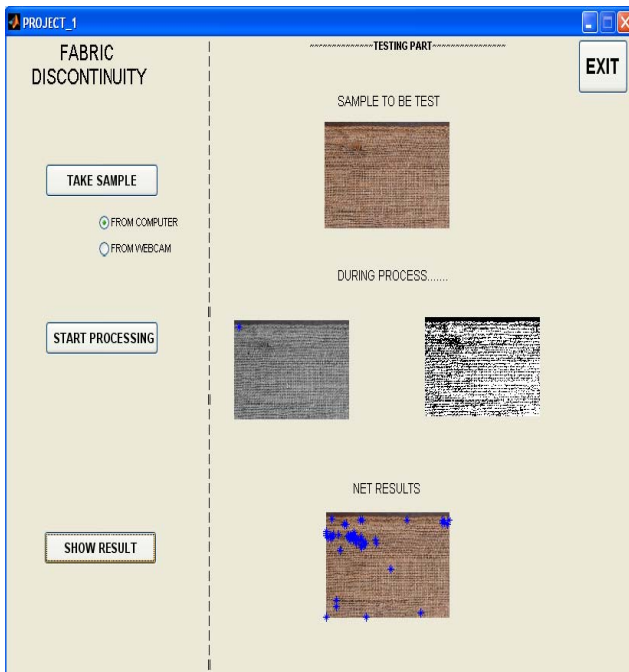
V.METHODOLOGY
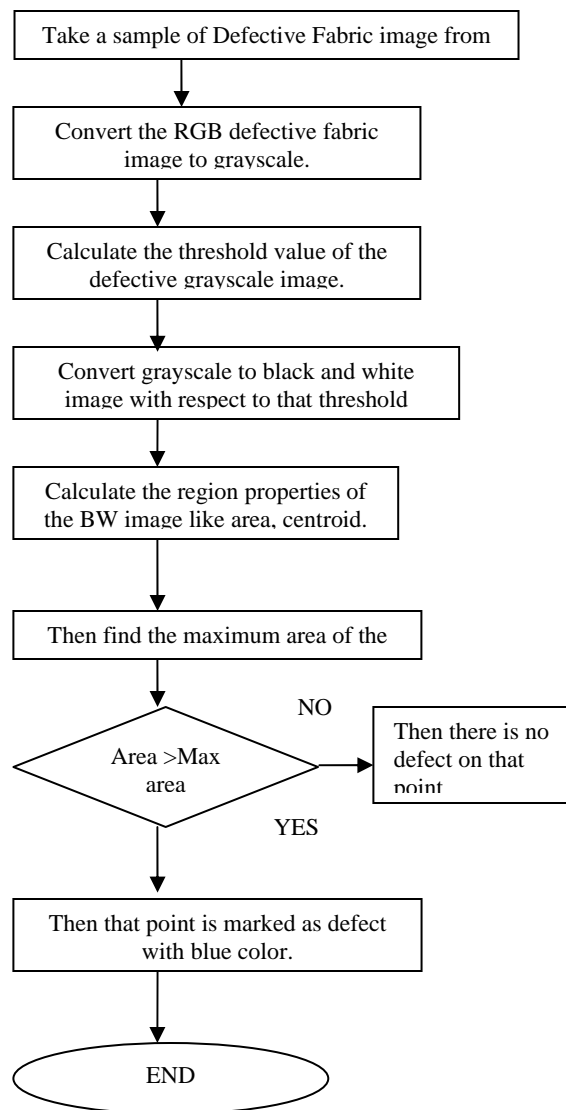
Figure 1:- Flow Chart of the methodology

VI. SIMULATION RESULTS
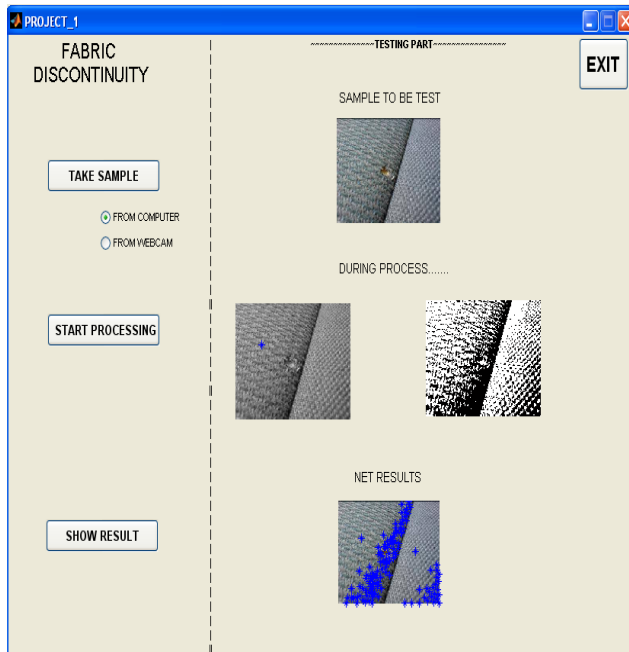
Figure 2:- Result window

Figure 3:- Result window

IV. CONCLUSION

The experimental results on different types of textiles shows that the developed algorithm is robust, scalable and effective for detecting various kinds of textile defects while addressing the problem of tardiness, low efficiency and high erroneous rate of manual detection. As it is simple and efficient, it is also appropriate to real-time defect detection.

REFERENCES

1. Jingmiao Zhangm and Linru Li, "*A new algorithm for Fabric Defect Detection Based on Image Distance Difference*" ,*IEEE Trans.* 2009 Third International Symposium on Intelligent Information Technology Application
2. Che-Seung Cho, Byeong-Mook Chung*, "Development of Real Time Vision-Based Fabric Inspection System*", IEEE Transactions on industrial electronics, Vol. 52, No. 4, AUGUST 2005.
3. Ajay Kumar, Member IEEE*, "Computer-vision based fabric defect detection"* IEEE Transactions on industrial electronics, Vol. 55, No. 1, JANUARY 2008.
4. TE-LI SU, HUA-WEI CHEN, GUI-BING HONG, CHIH-MING MA, "*Automatic Inspection system for defects classification of stretch knitted fabrics*" Proceedings of the 2010 International Conference on Wavelet Analysis and Pattern Recognition, Qingdao, 11-14 July 2010.
5. Hamid Alimohamadi, Alireza Ahmadyfard and Esmaeil shojaee, "*Defect Detection in Textiles Using Morphological Analysis of Optimal Gabor Wavelet Filter Response"*.
6. Zheng Guang, "Digital Image Processing &Application in Textile-defect Detecting system", QingHuangDao: Yanshan University,2004.
7. Lu Yun, Zhang Jingmiao, "FAbric Defect Detection Method Based on Image Distance Difference", Micro-computer Information,No 23,2007