



# INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

## FABRIC FAULT DETECTION BY USING IMAGE PROCESSING

SHRADDHA CHIMURKAR, APARNA LAKHOTE, PRACHI DALAL, NAMRATA WADHVE

Dept. of EnTC DMIETR, Wardha

Accepted Date: 15/03/2016; Published Date: 01/05/2016

**Abstract:** Fabric examination is important for maintaining the quality of fabric. Traditional inspection process for fabric defects is human visual examination which is inadequate and costly. The quality inspection process for textile fabrics is mainly completed manually. About 70% of fabric defects could be detected by the most highly trained inspectors. The main objective of this project is the processing of the defective fabric parts. In Textile industry automatic fabric examination is important to prolong the quality of fabric.

In textile industry improved performance in the evaluation of fabrics leads to good product quality and contributes to increased profitability and customer satisfaction. Therefore, automated evaluation of fabric defects, which results in the production of high-quality products at a high production speed is desirable. To upgrade this process the fabrics when processed in textiles the fault present on the fabrics can be analysis using MATLAB with Image processing techniques for the input image of a fabric, transform into grey scale image, noise filtering, binary image transformation, histogram technique, thresholding are applied on the image and the output is obtained.



PAPER-QR CODE

Corresponding Author: MS. SHRADDHA CHIMURKAR

Access Online On:

[www.ijpret.com](http://www.ijpret.com)

How to Cite This Article:

Shraddha Chimurkar, IJPRET, 2016; Volume 4 (9): 318-323

## INTRODUCTION

Quality is one of the important factor when it is to be considered in the production of textile fabrics. Fabric quality falls in to two parts, i.e., fabric properties and fabric defects. Fabric property is concerned in the field of the basic material, fabricate parameters and processing methods, and a fabric is considered to be defected when we fail in the right choice of basic material and its processing, it is due to

improper input parameters with respect to material, machine and man. Any differentiation to the knitting process needs to be investigated and corrected.

Defects fall into the various category. Since when they come into sight, reconstruct is needed, this is time consuming and sometimes results in fabric rejection. Fabric defect evaluation has been a long – felt need in the textile and apparel industry. Surveys carried out in the early 1975 shows that inadequate examination of fabrics has led to fabric defects being missed out, which in turn had great effects on the standard and successive costs of the fabric finishing and garment manufacturing processes.

Digital image processing is the use of computer algorithms to perform image processing on digital images. As a subpart of digital signal processing, digital image processing has many advantages over analog image processing. It allows a much extensive range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal deformation through processing.

Since images are defined over two dimensions (perhaps more) digital image processing may be classify in the form of multidimensional systems. Image processing is a method to convert an image into digital form and perform some process on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal exception in which input is image, like video frame or photograph and output may be image or characteristics attached with that image. Usually Image Processing system includes treating images as two dimensional signals while implementing already set signal processing methods to them.

Image processing basically involves the following three steps. Giving the input to the system through various means such as optical scanner or by digital photography.

Processing starts by first Analyzing and converting in to different stages and further calculating the image which involve data compression and image enhancement and spotting patterns that are not to human eyes like satellite photographs.

Output is the final stage in which result can be image or report that is based on mainly on the histogram output and the method of the image analysis

Project mainly describes the various difficulty faced while the handling of the system. It also explain on what ground do one needs to take a specific step forward for the killing of the

irregularly arise in that particular situation. Description is done about fault examination, positioning and classification of the defects that exists or can occur in the weaving machine during weaving by using the principle of image processing, an unconditional fabric detection system, which enable computerized defect analysis of weaved fabrics. This method include the process of detecting the fabric image capture by a digital camera. The advantage for the constructor here is to get a message when a certain amount of defect or imperfection occurs during the production of the fabric so that preventive measures can be taken earlier the product hits the market. Wastage reduction through accurate and early stage examination of faults in fabrics is an important aspect of quality improvement. The problem of web inspection, especially, is very essential and complex and the research in this field is broadly open Natural fabric and synthetic fabric are the two category of textile fabric. According to the requirement and constant innovation in textile industry. water proof, oil resistant, UV resistant and rubbing resistant fabrics are also available. Natural fabrics use animal's skin, the cocoons of silkworms, plants leaves, seeds and stems. It is soft and lasting. The types of natural fabrics are cotton fabric, silk fabric, wool fabric, leather fabric, hemp fabric. Fabric texture refers to the feel of the fabric. It is smooth, rough, soft, velvety, silky, and so on. The various textures of the fabric depend upon the category of weaves used. Textures are given to all category of fabrics, cotton, silk, wool, leather etc., In textile, various types of defects are available like hole, scratch, stretch, fly yarn, dirty spot, cracked point, color bleeding etc; if not detected properly these defects can affect the fabrication process massively. The objective of the proposed work is to identify whether the fabric is faulty or not. If it is faulty then identify the location and the type of the defect.

## II. LITERATURE REVIEW

Existing Solution :

The only answer to our difficulty is that the fabrics are been analysis through the labors. That is the solution is the manual detection of the fabric, which can be done in any situation. The solution to this problem is not appropriate since there are too much numbers of textile industries all over the world; also it is not workable for each and every labour to attentively look in to each and every part of the fabric very correctly .

The limitation of this type of the solution is that:

- Large number of staff is to be recruited in large scale industries.
- Sufficient staff should be appointed without having any disability.
- Appropriate conditions should be available for the work that is uninterrupted power supply and other favourable conditions.

Proposed System:

The proposed system should be able to scan in short should be able to correctly and clearly view each and every part of the fabric very easily that not a single defect should be out of reach. The system construct should pass through each and every stage of the built system as well as clearly pass through each and every technical features so that the fabric passed will be defect free and if there is the defect it should be intimated to the concerned person in the sector . The system should be able to take the input as the fabric image and then transmit that image into the gray scale image. Proper noise removal of the image should be done and it should be transmitted to the corresponding binary image. The result should be show in the form of the histogram and depending upon the authorized properties of the histogram the output is shown. In addition to the histogram properties the thresholding function that is also being judge for the output.

III. Detailed Descriptions

Block Diagram:

A. Input Image:

This is basically the image acquisition or collection block of the system. Here the defected or faulty fabric image is taken by the various types of camera like as CCD i.e. Charged Coupled Device camera, CMOS i.e. Complementary Metal Oxide Semiconductor camera, or any general Digital camera, etc. The pixel value of these cameras is should be around  $320 \times 420$  pixels. The acquired or collected image may or may not contain noise signal, if it consists of the noise signal it is required and necessary some per-processing techniques in the image. Noise must be eliminate from the image by using noise removal techniques.

A. Conversion of Color Image to Gray Image:

This is generally converting the original image that is being forwarded by the previous block in to the gray scale image. The gray scale image conversion is really very necessary since the further processing of the system is to be done on the gray image only. Investigate noise reduction in images using linear and nonlinear filtering techniques is applied.

B. Noise Removal and Filtering from the Image:

The image that is transmitted to the gray scale image is being given as an input to the noise elimination part of the system. In this part of the system the eliminate of the noise signal is done in order to examine the image for the faults in the image that is the fabric. The noise eliminator is one of the crucial part of the system since the noise in the image acts as the degradation in the image that can cause the degraded output of any system. Here in our system

the noise can influence the level of the intimation of the faults that the system is going to predict at the end.

C. Conversion to the Binary Image:

The noise of the image is being totally discard in the noise removal part of the system. The next step after the noise removal from the fabric image is the transmission of the noise removed image to the binary image of the original image. Here the transmission of the binary image is the necessary task since the original image is in the image format of the different formats. This transmission of the image to the binary image is required since the image is to be transmitted into the machine understandable format for the processing and that is done only with the help of the binary image. Various performance on the images is also done only on the binary images.

D. Histogram

A histogram generally the graphical description showing a visual impression of the distribution of data. It is an approximate of the probability distribution of a variable. In this system the collected frame of the image is detected for its occurrence, the every pixel of the frame which is obtained from the output of the image enhancement process is measured and their occurrence value is given between the standards 0 – 256 and their resultant values are marked in the histogram graph. Histogram here generally used to detect the defects of the fabric.

F. Thresholding:

Thresholding is the easiest method of image segmentation. From a gray scale image, thresholding can be used to develop images in thresholding, the color-image or gray-scale image is diminish to a binary image. Thresholding is a process of transmitting a gray scale input image to a bi-level image by using an optimal threshold. The purpose of thresholding is to remove those pixels from some image which represent an object (either text or other line image data such as graphs, maps). Though the data is binary the pixels represent a range of intensities. For a thresholding algorithm to be really powerful, it should maintain logical and semantic content.

There are two basic types of thresholding algorithms:

- Global thresholding algorithms
- Local or adaptive thresholding algorithms

IV. ADVANTAGES

- Ø It is very less time consuming.
- Ø Its cost is low.
- Ø Reliability & Maintenance free.
- Ø Its accuracy is better than existing process.

#### V. APPLICATIONS & FUTURE SCENARIO

Applications-

- Ø Textile Industry
- Ø Handlooms
- Ø Apparel Industry
- Ø Cotton Industry

Future Scenario-

In future this work may be expanded such that the output is given to neural network and the Microcontrollers of any type can be exploit and programmed such that it can examine the defected fabric part. If the microcontroller is connected with motors of any category then it will be operated under normal fabric condition and can stop the motor if there is any defect on fabrics.

#### VI. CONCLUSION

In this paper computer aided fabric fault detection is implemented. Particle Analyzer is performing like the manual Inspection. PC-based approach is low time consuming and efficient while compare with the manual inspection and micro controller based inspection methods. As a future scope, more number of samples can be examined and the processing can be done by simultaneous capturing of the image.

#### REFERENCE:

1. Priyanka Vyas, Manish Kakhani, "Fabric fault processing using image processing techniques.
2. Jagruti Mahure, Y.C.Kulkarni, "Fabrics Fault Processing Using Image Processing Technique in MATLAB".
3. R.Thilepa, "A paper on automatic fabrics fault processing using image processing technique in matlab".
4. R. C. Gonzalez, R. E. Woods, S. L. Eddins, "Digital Image Processing using MATLAB", 2005, pp. 76-104, pp. 142-166.