

Blister Testing in MATLAB

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ABSTRACT

Medicines have helped to make our lives easy. Drug industry is developing industry in terms of production as well as consumption. Medication has become very important in everyone's life as we are affected by so many diseases. But these medicines might be defected, tablets may be broken, there may be missing tablet in a strip and consumption of these drugs might be dangerous. This project shows a method in digital image processing technique to find the defects in tablets. In this project we use mathematical manipulation, to detect the defected tablet packet.

Keywords:- Micro-controller, servo motor, dc motor, conveyer belt, web cam, spdt relay, robotic arm, Image Processing.

I. INTRODUCTION

Digital image processing techniques and algorithms are applied on images in order to remove error. In this paper, we use digital image processing technique to detect the broken tablet. Such tablets are harmful to consume and may have many side effects. The inspection process is effective to detect the defects in tablets. Mathematical manipulation is used to detect the defect. This is done in Matlab10. First Image is taken and is converted into gray and then to binary and then noise is removed. Morphology operation is used to remove the noise. Morphology operation is applied on binary images therefore for this image is first converted into gray.

This technique will find the defect in those tablets which are circular in shape.



Artificial intelligence:

The collective attribute of computer, robot or other device capable of performing functions such as learning, decision making or other human behaviours.

Automation:

It can be defined as the machine is designed to carry out or do variety of operation.

Identify and remove:

It can be defined as robotic arm to remove the product once the fault is identified.

I.I. Methods of detecting Irregularities in the Blister

1. Image enhancement

This refers to processing an image so that the result is more suitable for a particular application.

2. Image restoration

This may be considered as reversing the damage done to an image by a known cause, for example:

- removing of blur caused by linear motion.

3. Image Segmentation

This involves subdividing an image into constituent parts, or isolating certain aspects of an image: finding lines, circles, or particular shapes in an image, in an aerial photograph, identifying cars, trees, buildings, or roads [3].

II. BLISTER TESTING WITH MICRO- CONTROLLER USING MORPHOLOGY

The project is based on a pre-programmed PIC16F72 micro controller. The complete system divided in three sections. PC USB interfacing, Motor Driver, and power supply section

III. SAFETY SYSTEMS

Safety of the devices is the measure concern of any device or machine. So for the safety purpose there is use of a two sensors i.e obstacle detection and fire detection with the help of buzzer.

Power Supply:

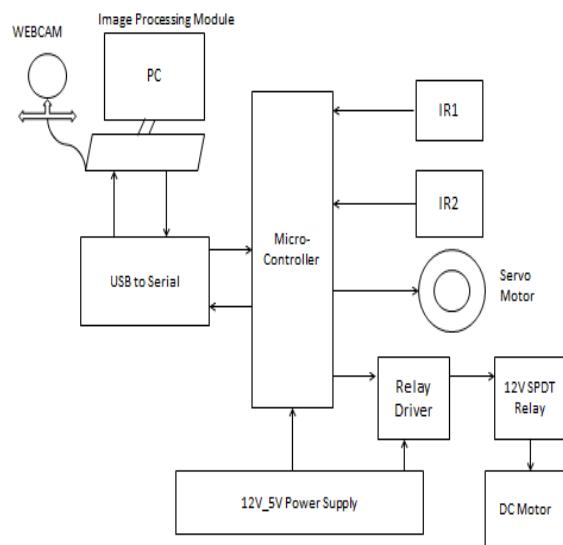
The power supply circuit. It's based on 3 terminal voltage regulators, which provide the required regulated +5V and unregulated +12V.

Power is deliver initially from standard 12V AC/DC adapter or 12V battery. This is fed to diode D1. The output of which is then filtered using 1000uf electrolytic capacitor and fed to U4 (voltage regulator). U4 +5V output powers the micro controller and other logic circuitry. LED L2 and its associate 1K current limiting resistors provide power indication. The unregulated voltage of approximately 12V is required for Motor driving circuit (U3) and DC Motor.

Infrared light-emitting (IR LED – IR1-2):

An infrared light-emitting diode (LED) is a type of electronic device that emits infrared light not visible to the naked eye. An infrared LED operates like a regular LED, but may use different materials to produce infrared light. This infrared light may be used for a remote control, to transfer data between devices, to provide illumination for night vision equipment, or for a variety of other purposes.

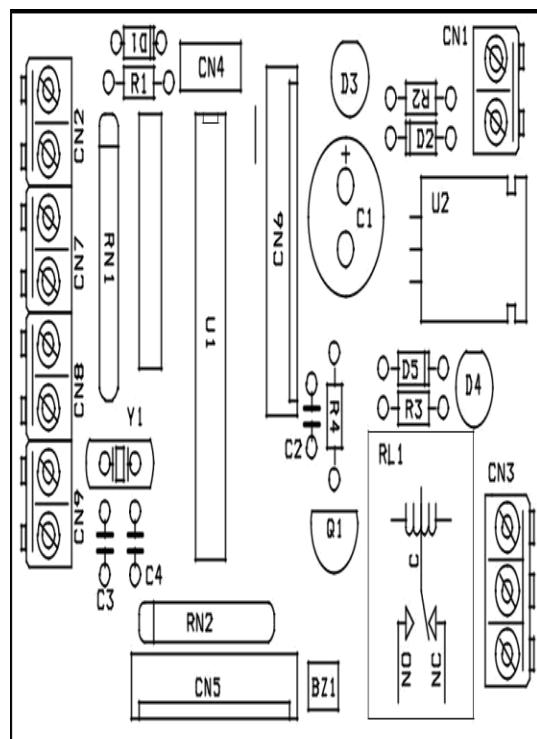
IV. ARCHITECTURE



In this algorithm different types of sample of capsules and tablets.

One of the tablet sample (Fig 1) undergoes the steps to find whether there is any defect in the blister. In the process, the input image is converted into gray scale image (Fig 4). The industrial and other noises are filtered from the gray scale image which makes the image fit for further processing. Canny edge detection (Fig 5) operator is used for edge detection to filter the tablets from its background. The template image is stored in the system based on the type of input blisters. The template image undergoes all the pre-processing steps similar to the test image. The template image is of single tablet which is compared to each tablet in the blister. If the shape varies then the package is identified as defective tablet[9].

V. CIRCUIT DIAGRAM



VI. CONCLUSION

The proposed system was analyzed with different type of samples such as defective and non-defective tablet packs and also different kinds of tablet packs such as clear PVC pack, colored PVC pack and opaque tablet pack. The table-I list out the result obtained for different type of tablet packs.

TABLE 6.1- RESULT OBTAINED FOR DIFFERENT TYPE OF TABLET PACKS

Condition	Detection		
	Clear PVC pack	Colored PVC pack	Opaque pack
Missing Tablets	Yes	Yes	Yes
Damaged Tablets	Yes	Yes	No
Size Mismatch	Yes	Yes	Yes

The defective blisters were easily identified. With iball 20.0 HD webcam the system was able to inspect 60 tablet packs per minute. Required system speed can be achieved by use of higher resolution and better image sensory camera. This prototype is a solution

for small scale pharmaceutical companies where the inspection of tablet packs are done manually[9].

REFERENCES

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