



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact factor: 4.295
(Volume 4, Issue 1)

Available online at www.ijariit.com

Controlling Theft through Object Detection

Shubham Saurav

shubhamsaurav.910@gmail.com

Bharati Vidyapeeth College of Engineering Pune

Syed Hanaz Tariq

syedhanaz36@gmail.com

Bharati Vidyapeeth College of Engineering Pune

ABSTRACT

An effective method is presented for the detection and tracking of objects from a video sequence captured by a Charge couple device web camera with Motion sensors using the fundamentals of Digital Image Processing in MATLAB platform for Delhi based Arts and Handicrafts Company, YASIN SHAWALS. This firm was established in the year 3000 and since its inception, it has achieved the milestone in International Trade of Kashmiri goods and handicrafts.

In this sponsored project we are making the system for detecting the theft issue of the expensive goods from the store house and to keep an eye on the motion of even the small object. Hence through this project, we are modifying the security of articulated goods.

For increasing the security, Black Electrotech we60 Degree PIR Motion sensor is being interfaced with the charged couple device webcam Quantum 495 Lm Camera with a picture resolution of 14 MP.

The captured image is processed through Image acquisition tool and then an algorithm is used for image enhancement. Wavelets and different layers are observed minutely and morphological operations are performed for transforming the image into GRAY level. These transformed images are segmented and through the filter, edges are detected. Hough Transformation is used for recognizing the object and finally, a comparison of different images take place by using MATLAB.

Keywords: *PI Motion Sensors, MATLAB, Charged Couple Device Web camera, Hough Transformation.*

1. INTRODUCTION

Through this project, we are trying to solve the examined image and break it to solve unnoticed theft where data can be stored and proper workouts shall be done. To provide security in storage house PI sensor and application of digital image processing is used. Pseudo-Code is being used which may be helpful to write the initial statements of our program in an organized format using our understandings. This pseudo-code is often easier to put the brain work, reviews, and modification than using a predefined programming language, yet it is easily

translated into a programming language in the next stage of the project.

Right data structures are being selected at what data types and structures are available in MATLAB and determine which of those best fit our needs in saving and processing our programs. Here in this project, PI MOTION Sensor is being interfaced with the computer through the PBC Board. The displaced motion sensed by the PI Sensor is compared with the image captured by the Quantum charged couple device webcam on the MATLAB platform. The acquiesced wavelets of an image are resolute multiple times after acquisition. Then these undergo morphological operation such as image segmentation, edge detection. The image is recognized using

Layering and Hough Transformation and finally the images are compared thoroughly.



Figure 1: Proto Type of Project

2. HARDWARE DETAILS

PI Motion Sensor

The sensor uses the automatic control product of infrared technology when people walk into the sensor range, and the sensor can detect the spectral change of the human body infrared ray, during this time, the switch will connect the load automatically until the person leaves the sensor range. Through the photosensitive control, it will not turn on the lights in the daytime or light environment, but also can be adjusted in any lighting environment sensing lights.

Sensitivity Adjustable: Turn On Lights during Day or nights. It can use with lamps, incandescent lamps (bulbs), old-fashioned fluorescent lamps, electronic fluorescent ring lamps, spotlights, transformers, small electrical appliances, and other all other appliance.

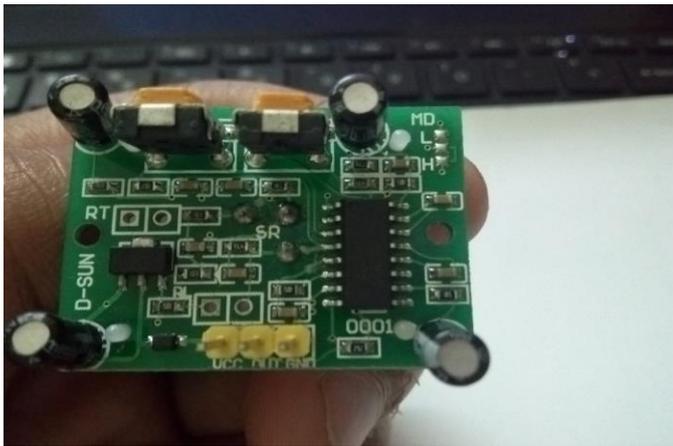


Figure 2: Motion Sensor Hardware Circuit

Charged Couple Device Webcam

This Quantum 495 Lm Camera has an inbuilt snapshot switch that allows we to click pictures while browsing we PC with a picture resolution of 14 MP. The webcam is built with a high-quality 3G glass lens producing sharp picture quality. With this webcam, we can click pictures with an image focus from we cm to infinity. It is also equipped with USB 3.0 high-speed interface. The webcam also has an AWB (automatic white balance) feature that helps us to take clear and natural images. We can also video chat or take pictures outdoor as this features anti-flicker 50-60 Hz frequency for outdoor resolution. It also comes with additional features of 16 special effects and 10 background frames and can control l brightness, sharpness and color control options. Thus we will also now have the liberty to edit the picture immediately and get the expected image output.

This webcam has a resolution of 35 MP for a flawless video chatting experience. The 6 lights attached to the rim of the webcam is equipped with a potentiometer automatically switches on when in dark. The Quantum Webcam has an inbuilt snapshot switch that allows us to click pictures while browsing we PC with a picture resolution of 14 MP. This Quantum Camera (With 6 Lights & 35 Megapixel) has a highly sensitive in built microphone. It produces the best quality of sound and we will not have to strain ears again ever to hear.

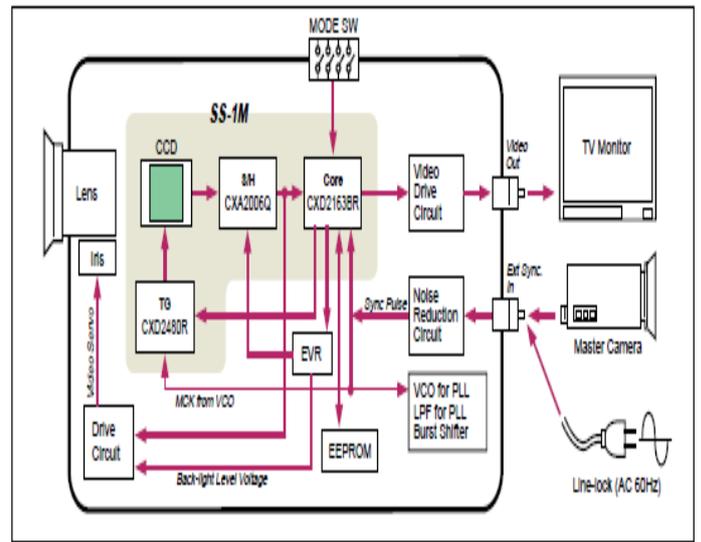


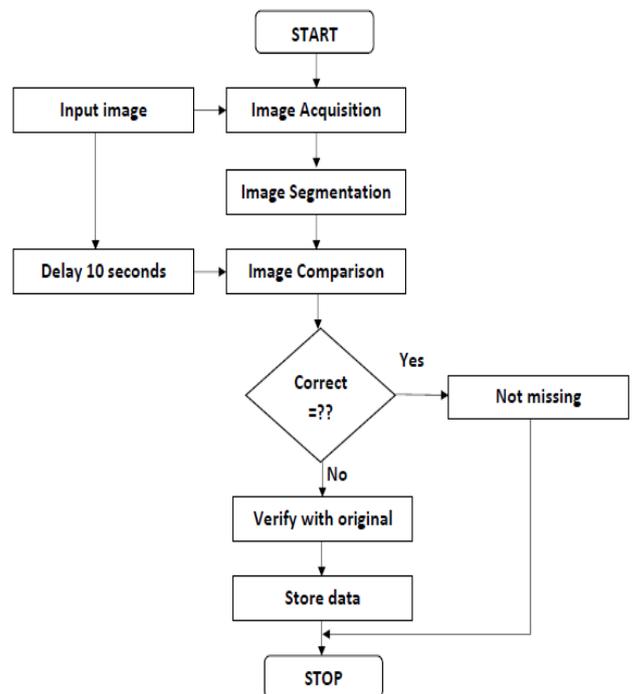
Figure 3: Charged Couple Device Circuit Model

3. SOFTWARE DETAILS

MATLAB is gigantic-carrying out language for technical tote ups. It integrates enumeration, perception, and programming in an easy-to-use ambiance where crunches and solutions are expressed in homespun mathematical script.

Being an interactive system that doesn't offer to dimension. Through this many technical computing crunches, especially those with matrix and vector formulations, in a fraction of the time it would be solved.

A. Flowchart



B. Dynamic Analysis

Here dynamic analysis has taken place where the input $F(x, y, z)$ represents the spatial coordinates of the moving ambiance.

C. Motion Field

Motion field is a two-dimensional representation of the moving object in terms of three-dimensional field in the moving world.

D. Estimating Motion Field

- Blocks matching.
- Objects. Interpretation matching needed. A sparse motion field.
- Interest points matching.

E. Image Segmentation

The output of image segmentation is a set of segments that the entire image is collectively covered, or a set of contours is extracted from the image. Pixels obtained in the region are similar with respect to some characteristic, such as color, intensity, or texture. The following methods are:

1) Subtraction of Background

- The background model must be defined
 - Comparison of background with the current image and then the subtraction takes place.
- 2) The resultant objects after subtraction obtained are the new foreground objects.

F. Morphological Operation

It involves GRAY level transformation which is further classified into following:

- Linear
- Logarithmic
- Power – law

- Linear Transformation

Linear transformation includes identification and negative transformation. Identity transition is represented by a straight line. In this transition, mapping of each value of the input image to each other value of output image is performed directly. Hence it results in the identical input image and output image. Therefore called as identity transformation.

- Logarithmic transformations

The logarithmic transformation has two type of transformation that is Log transformation and inverse log transformation.

Log transformation

The log transformations can be defined by this formula

$s = c \log(r + 1)$; where the pixel values are s and r respectively of the output and the input image and c is a constant. The value 1 is added, to make the minimum value at least 1.

During log transformation, expansion of the dark pixels in an image as compared to the higher pixel values. The higher pixel values are kind of compressed in log transformation. Hence image enhancement is being observed.

- Power–Law Transformations

In power law transformations, n th power and n th root transformation are included. These transformations can be given by the expression:

$$s = cr^\gamma$$

Because of the symbol γ the transformation is also known as gamma transformation. The enhancement of the images is varied by the value of γ . Since different display devices have their own gamma correction, that's why their images are displayed at a different intensity so this type of transformation

is used for enhancing images for a different type of display devices. Different display devices have different gamma. For example, Gamma of CRT lies in between of 1.8 to 2.5, that means the image displayed on CRT is dark.

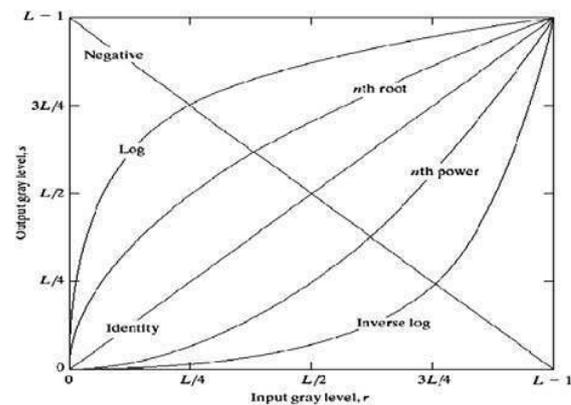


Figure 4: Graphical Output of Morphological Operation

G. Object Recognition by Hough Transformation

The feature extraction technique is done by Hough transformation for analysis of the image, computer visioning, and processing. The aim of the technique is to find imperfection in objects within a particular segment of shapes by a procedure of voting. The voting procedure is carried out in a parameter focusing space, from which objects are obtained as local maxima that are explicitly constructed by the algorithm for computing constructed by accumulator space in the Hough transform. The problem of finding the object (described with a model) in an image can be solved by finding the model's position in the image. The generalized Hough Transform helps in mapping the model into the image. The position of the model in the image can be determined by the value of the transformation's parameter. The original implementation of the GHT uses edge information to define a mapping from orientation of an edge point to a reference point of the shape.

H. Image Comparison and Overlap in MATLAB

Two or more things can be compared by eye through visual comparison which is done by placing images side by side; by overlaying them; by alternating an image or by presenting each image to a separate eye.

Eyeballs parallax can be controlled sufficiently by people can hold up two paper printouts and go cross-eyed to superimpose them which invokes deep, fast, built-in image comparison wetware (the same machinery responsible for depth perception) and differences stand out almost immediately. The method is superb for finding problems in graphical images, or for comparing an image with a compressed version to spot artifacts. In this method, an image comparison tool is predefined in the image processing software and after that, the comparison takes place in it. This lead to comparing the various images in the store house and thereby following measures are taken against any mal practice.

4. CONCLUSION

In the above idea presented, we have come to the point that Image Processing Platform is one of the most efficient ways of analyzing the motion field of the data under analysis. This project shall be implemented in YASIN SHAWLS for their security purpose in storage house where various artifacts shall be closely observed in the software and further processing takes place if found any.

Here motion sensor shall detect the motion of the object and through web camera, further observations shall be taken care off. The process shall happen at the interval of ten seconds and then comparison and further verification shall take place. The data are stored and can be retrieved for further purpose.

5. REFERENCE

- [1] Digital Image Processing Second Edition by Rafael C. Gonzalez, University of Tennessee Richard E. Woods MedData Interactive.
- [2] Digital Image Processing T.Peynot.
- [3] International Journal of Innovative Research in Computer and Communication Engineering *an ISO 3297: 2007 Certified Organization Vol.5, Special Issue 2, April 2017*. An International Conference on Recent Trends in ITS Innovations - Tec'afe 2017 Organized by Dept. of Computer Science, Garden City University, Bangalore-560049, India. A Survey on Types of Noise Model, Noise and Denoising Technique in Digital Image Processing Sumanth S, A Suresh Research Scholar, Periyar University, Salem, Tamilnadu, India Principal, Maisurii Women's College of Arts and Science, Kakapalayam, Salem, Tamilnadu, India.