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Counting of Objects in Video Images Using Morphological Operator

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ABSTRACT

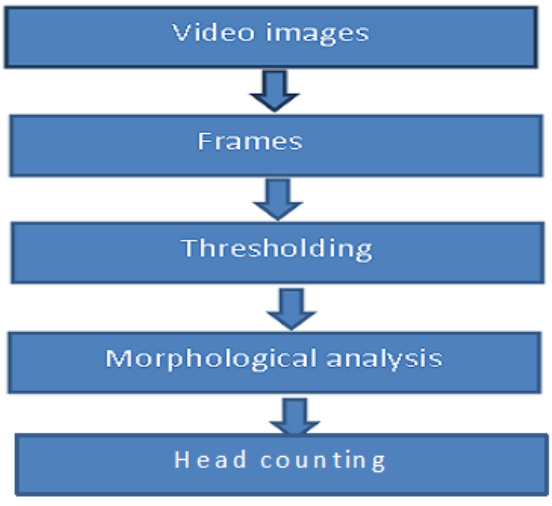
Crowd detection and object counting is an important task in video image processing. In this project a new method of counting objects in a crowd is presented using conventional edge detection method is not accurate to count the objects.. The first stage of the project is to convert video images into frames and there after subjected to various thresholdind techniques. The second stage of the project proceeds with the counting of objects in a crowd of people using morphological operator. Comparative analysis is done using various operators and performance evaluation is carried out to determine the efficiency of proposed method. The simulation of the project is implemented using Laboratory Virtual Instrumentation Engineering work bench. (Lab VIEW version 13.0)

Keywords: Image processing, Morphological operators, Lab VIEW

INTRODUCTION

A fundamental task in crowd analysis that enjoys wide spectrum of applications is to automatically count the number of people in crowd. Human head is one body part that can be robustly detected even in crowded scenes, therefore in this paper a method for human detection and counting based on head detection is implemented. The first stage of this project is to convert video image into frames. The second stage of this project is subjected to various thresholding techniques. Thresholding means to selects ranges of pixel values in a images. The third stage of this project proceeds with the counting of head in a crowd of people using morphological operator. The form and structure of an organism one of its parts. The morphological operations can be customized for an application by the proper selection of the structuring element, which determines exactly how the objects will be eroded. Finally count the number of people in a crowd using morphological operator. Comparative analysis is done using various operators and performance evaluation is carried out to determine the efficiency of proposed method.

PROCESS FLOW DIAGRAM



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OVERVIEW OF METHOD

The descriptor system consists of processing the video images into frames. Next stages of the project is thresholding techniques then go to morphological process; finally count the number peoples and objects in a crowd. The main process of this project is Thresholding and Morphological analysis.

Thresholding

Once we have computed a measure of video images into frames, the next stage is to apply a threshold, to decide whether edges are present or not at an image point. The lower the threshold, the more edges will be detected, and the result will be increasingly susceptible to noise and detecting edges of irrelevant features in the image. Conversely a high threshold may miss subtle edges, or result in fragmented edges. Once we have a start point, we then trace the path of the edge through the image pixel by pixel, marking an edge whenever we are above the lower threshold. We stop marking our edge only when the value falls below our lower threshold. This approach makes the assumption that edges are likely to be in continuous curves, and allows us to follow a faint section of an edge we have previously seen, without meaning that every noisy pixel in the image is marked down as an edge. This process is applied to very frames in each cycle. Three types of thresholding.1.Manual thresholding 2.Local thresholding 3.Auto thresholding. Local thresholding divided into two types.(i).Ni-Black (ii).Background correction. The meaning of Ni-Black is each pixel based on the statistics of surrounding pixels. It compensates the high lighting variations. Meaning of Background correction is eliminating the non-uniform lighting. Auto thresholding classify into five methods.(i).Clustering-Threshold image based on a statistical techniques.(ii).Metric-Calculating the optimal threshold depends on surfaces representing the initial gray scale.(iii)entropy-Calculating the optimal threshold depends on Analysis techniques.(iv).Moments-Statistical tool recalculates a theoretical binary image

Morphological Analysis

Morphology analysis has developed from binary morphology to gray scale morphology, and it is new method of image process. Its basic idea is to measure or distill corresponding shape in image using structure element with certain shape to analyze image and recognize object. The basic operations included in dilation, erosion, opening, and closing. Based on these four kinds of operations various morphologic algorithms could be deduced. Morphology of Omni directional multi-scale element is defined in order to suppress noise and adapt to different edge in the image. It constructed by power adding combination of morphological operation. These functions are applied to images that have more than two levels. These functions are used to modify the shape of the areas by extending the bright areas and reduce the dark areas, and vice-versa. The morphological transformation type's encounters in this case are mainly the same as the ones used for the binary images: erosion, dilation, closing, opening etc. The function leads to a binary image by thresholding a gray scale image. Performs basic morphological transformations.

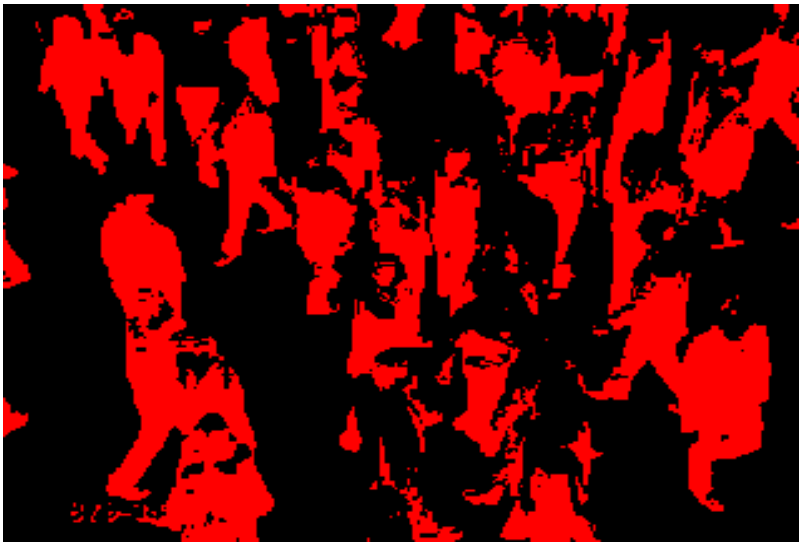
The algorithm for Morphological operators as follows:

Step 1: Acquire the input image as morphological image
Step 2: Read the input image
Step 3: Apply gray level morphological operators
Step 4: Apply morphological operation (erode techniques)
Step 5: Get the output image

RESULTS

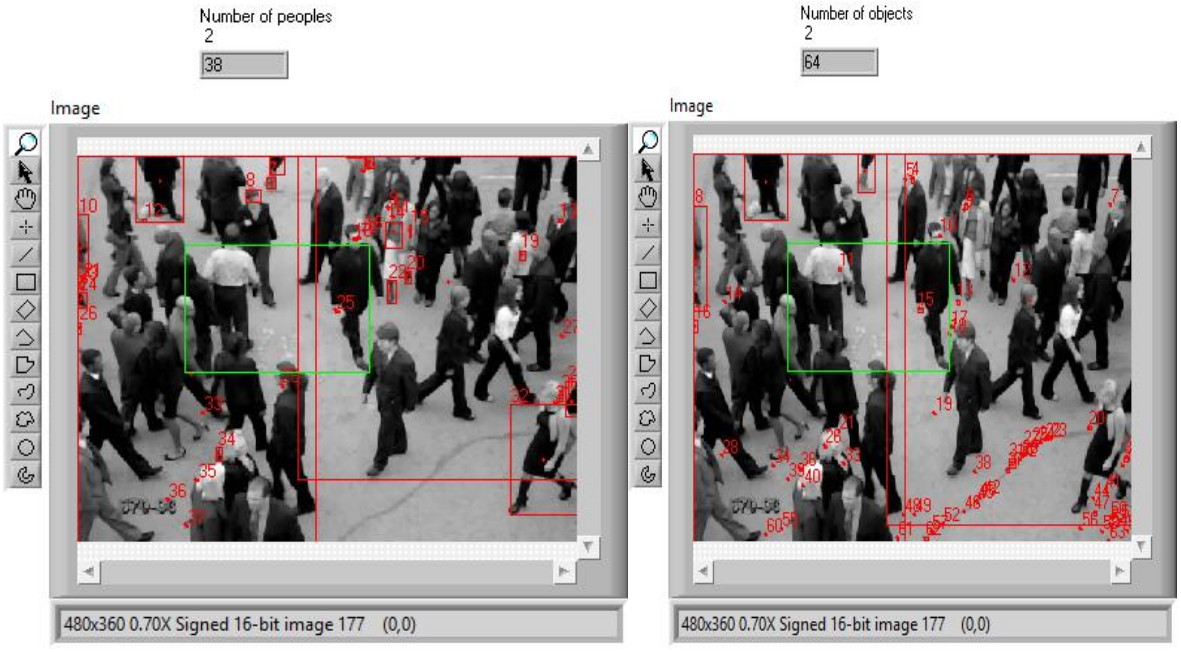
Original Image

Threshold Output Image

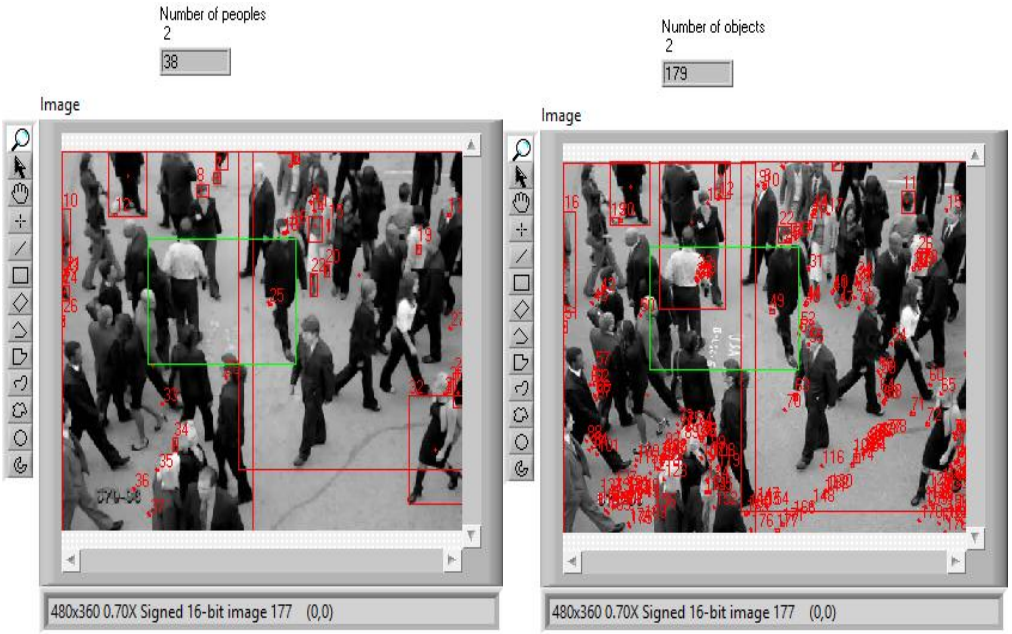


Erode Morphological Output Image

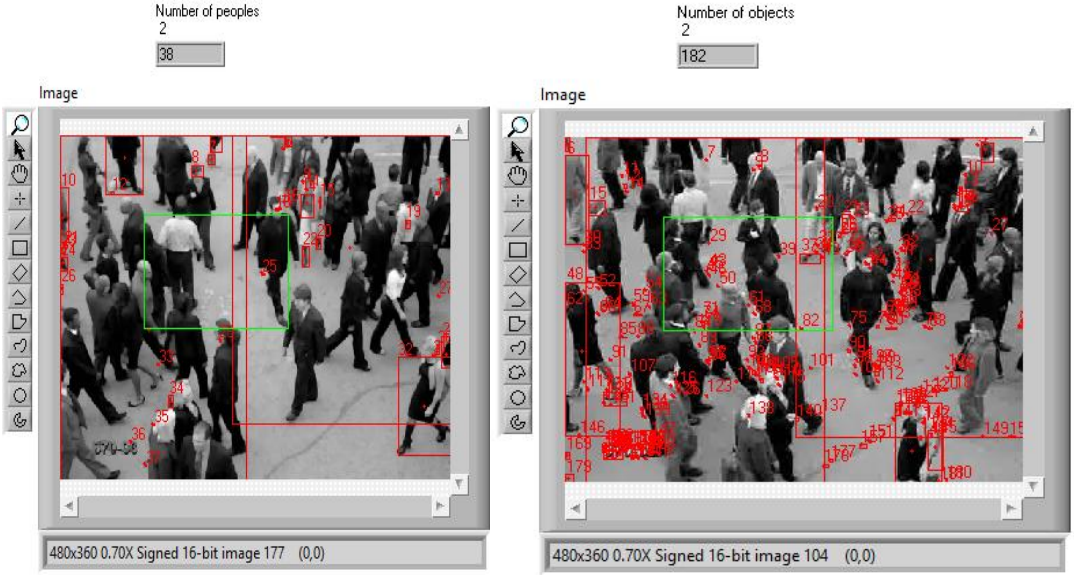
Object Counting Output Image



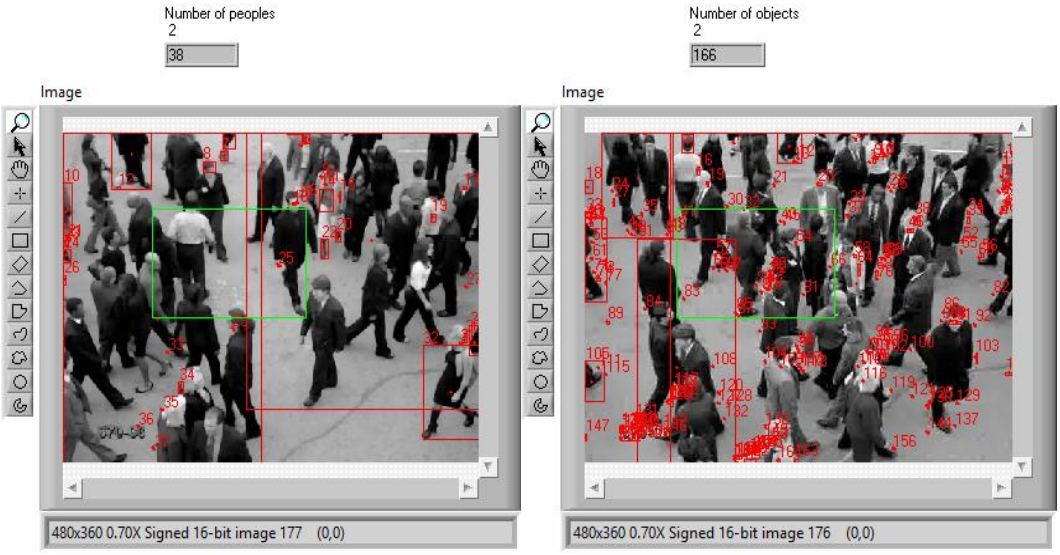
Frame Image 1



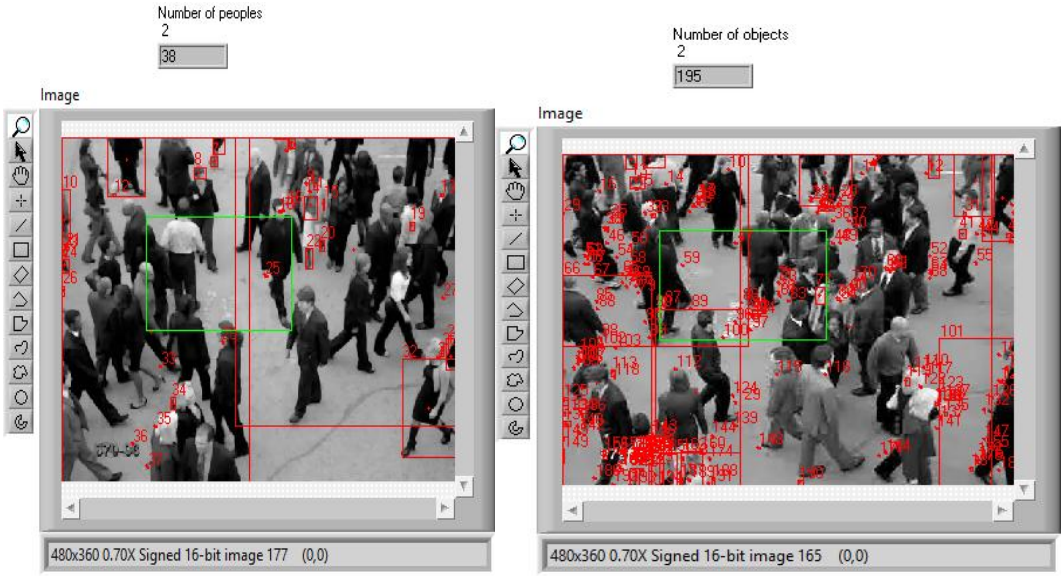
Frame Image 2



Frame Image 3



Frame Image 4



CONCLUSION

From the results, it is concluded that this project is based on video image processing. Edge detection techniques, we only measure the edges, and the objects are not to be counted, by these proposed morphological operators. We can easily measures the objects and heads by means of various techniques like (erode, dilation, p open, p close) and counting measures.

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