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FERRATING OUT AN OBJECT USING TRACKER EVALATION METHODOLOGY

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Abstract— The fundamental intension of computer vision is to enable and replicate the ultimate functions of human vision such as motion approach and scene understanding. To achieve the goal of intelligent motion approach, more effort has been spent on visual object tracking which is the most important, fastest evolving and challenging research topics in computer vision. Every year, dozens of new object tracking algorithms are presented and evaluated in journals and at conferences. The problem of visual tracking evaluation is witnessing a large variety of performance measures, and largely suffers from lack of consensus about which measures should be used in experiments. Furthermore, the previous works are less effective, that the results may be skewed or biased particularly towards tracking aspects. We revisit the popular performance measures and tracker performance visualizations and by analyzing them theoretically and experimentally. We show that several parameters are equivalent from the point of information they provide for tracker comparison and crucially, that some are more brittle than others.

Index Terms—Visual object tracking, performance evaluation, performance measures, experimental evaluation.

I. INTRODUCTION

Visual tracking is one of the important field in computer vision. Essentially, the core of visual object tracking is to robustly estimate the motion state of a target object in each frame of an input image sequence. In recent years, a research on visual object tracking has been published. Research interest in visual object tracking comes as real-world applications in wide range, including visual surveillance, traffic flow monitoring, video compression, and human-computer interaction. For example, tracking an object is successfully implemented to monitor human activities in residential areas, parking lots, and banks. Video surveillance is under research topic in computer vision that tries to detect, recognize and track objects over a sequence of images and it also attempts to understand and describe object behavior by replacing the aging of old traditional method of monitoring cameras by human operators. Object tracking is the process of locating an object or multiple objects over time using a camera. There are three major steps involved in video analysis,

i. Detection interesting moving objects
ii. Tracking of such objects in every frame, and
iii. Analysis of object tracks to recognize their behavior.

Therefore, the use of visual object tracking is pertinent in the motion based recognition in this task.

II. RELATED WORK

The existing object tracking algorithm is designed based on particle filtering. The particle filtering generates one variable dynamically before moving to the next variable for all the method. The particle filter is a Bayesian sequential importance Sample technique, which recursively approaches the later distribution using a finite set of weighted trials. It also consists of fundamentally two phases: prediction and update and is also known as condensation algorithm. In this method we assume that the object to be tracked is marked/ detected on the first frame manually or automatically. For each incoming frame, several candidate states of the target are predicted with a motion model. In moving object detection various measures such as background subtraction techniques are used. Background subtraction involves the absolute difference between the current image and the reference updated background over a period of time. A background subtraction should be able to overcome the problem of various illumination condition, background clutter, shadows,

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camouflage, bootstrapping and at the time motion segmentation of foreground object to be done at the real time.

It's hard to get all these problems solved in one background subtraction technique. This algorithm extract target features by combining IPCA and color histogram to obtain the robust feature representation.

III. EXISTING SYSTEM LIMITATIONS

- Backward validation based algorithms would lose tracking of the targets with large appearance variation.
- The most efficient number of particles cannot be calculated.
- Distributions are only approximated which leads to calculation errors.

IV. CONTRIBUTED WORK

In this paper, we introduce a generative tracking algorithm based on linear regression. The contributions of this work are, First, we introduce a novel linear regression method, Least Soft-threshold Squares (LSS), which assumes the error vectors as Gaussian- Laplacian distribution. Second, we present an efficient iteration method to solve the LSS problem and propose a LSS distance to measure the dissimilarity between the observation vector and the dictionary which produces global minimal solution. It is noted that the LSS method is related to the robust regression with the Huber loss function and is effective in detecting outliers and therefore provides an accurate match, which facilitates object tracking (e.g., in dealing with partial occlusion).

A. LSS ALGORITHM

In the contributed work, the proposed Least Soft-threshold Squares (LSS) algorithm models the GMM noise term as the Gaussian- Laplacian distribution. Based on maximum joint of parameters, they derive a LSS distance to measure the difference between an observation sample and the dictionary. Compared with the distance derived from ordinary least squares methods, the proposed metric is much effective in dealing with edges and outliers. In addition, we present an update scheme to capture the appearance change of the tracked target and ensure that the model is properly updated.

B. ADVANTAGES

- LSS method is related to the robust regression function and is effective in detecting outliers.
- The proposed method performs well in terms of position, rotation and scale when the target undergoes severe occlusion.
- The proposed LSS distance encourages good matching results when outliers occur, our tracker performs better than other methods in these videos.

BLOCK DIAGRAM

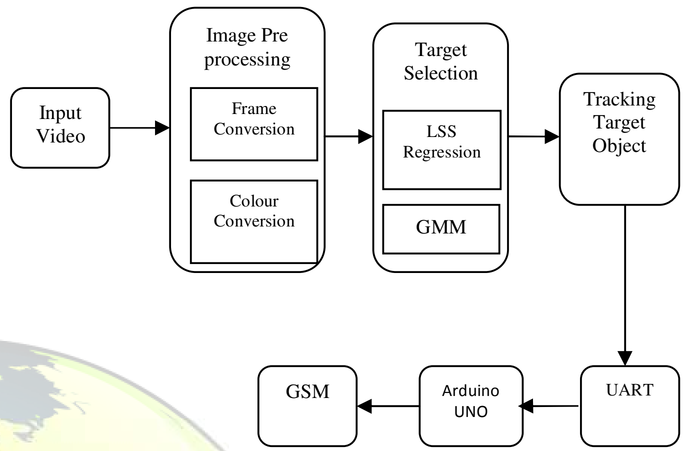


Fig.1.Block diagram

C. EXPLANATION

In this paper, we first take an input video (Say CCTV footage) which undergo an image processing techniques like Frame conversion and Color conversion using MAT Lab. MATLAB provides a wide range of numerical computation methods for analyzing data, developing algorithms, and model creating.

There are several ways to import and export images into and out of the MATLAB environment for processing. We can use Image Acquisition Tool to acquire live images from mobile cameras, webcam and other devices.

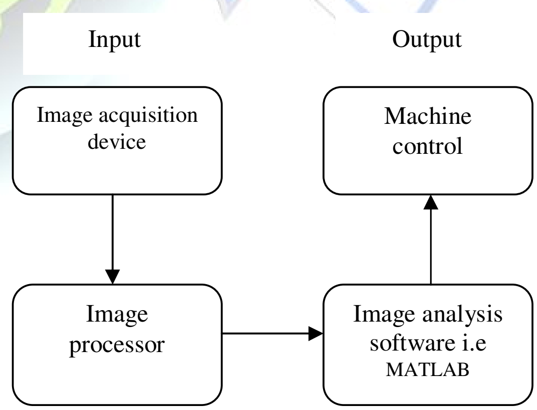


Fig 2. Image processing in MATLAB

An image acquisition device can be a video camera, which is used for capturing images. The image input can be captured either with the help of digital or analogue cameras. Most importantly, these cameras should be capable of delivering images at different resolutions.

Input video is converted into n number of independent frames and these RGB colored frames are converted into Gray colored frames. This color conversion is done internally to avoid tracking of wrong target. Image analysis can be done by extracting some of the functional details from the captured images. Therefore, if there is a requirement for identifying an object, then robust characteristics of a moving object like color, pattern, clear edges, intensity, and structure must be noted. Then the target to track throughout the video is initialized.

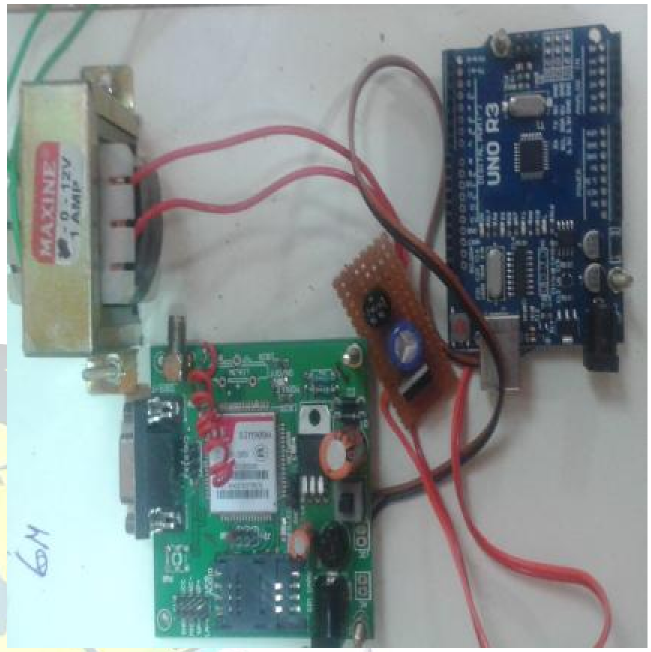
In previous works, when an object crosses the target, the tracker mistaken the crossed object as target and continue to track that wrong object. In our proposed work, as introduced, LSS regression method assumes GMM noise over the target and starts tracking. Even if an object crosses the target, the tracker correctly and efficiently tracks the target without any mistake. If the target is not present in the current frame, then the algorithm iterates continuously until it finds the target in the frame. If present, then tracker tracks it fully till the video footage ends.

If the tracking has completed and the tracker has identified and tracked the target object till the end of the video, then it stimulates the alert message. Through the serial port of 9600 baud rate, the alert message is passed to the arduino board which then passes the message to the GSM 900 module which uses 900MHz frequency to transfer the messages or data. Then the mobile phone gets the alert message via the GSM module. And finally, we could able to know the object which has been tracked throughout the video.

D.RESULT

Object tracking is implemented by using video as input. In order to process the input video it has been converted into frames. The core of visual object tracking is to robustly estimate the motion state of a target object in each frame of an input image sequence. In this method we assume that the object to be tracked is marked/ detected on the first frame manually or automatically. And the moving target object is fixed as shown in the below figure.

The moving object is tracked to the end of the video by checking each frame.



The tracking has completed and the tracker has identified and tracked the target object till the end of the video, then it stimulates the alert message through arduino. Arduino is the major part to control the GSM and serial communication. After tracking the person, SMS will be sent by using the GSM module to the mobile.

E.FURTHER ENHANCEMENT

Our project has the advantage that it can support the video taken even in the mobile phones rather than the videos from CCTV cameras. The tracking of videos taken in the mobile is efficient under the criteria when it is captured only in the landscape mode. Otherwise, the tracker wrongly tracks the crossed person.

V. CONCLUSION

Thus in this paper, we have proposed algorithm for visual object tracking by updating the appearance model first and then using the information from the incoming frame to check whether the updating of the appearance model during former period is valid or not. Experimental results on challenging video sequences have demonstrated the proposed algorithm can obtain much better performance than other five existing ones, especially in occlusion and appearance variation co-existing scenarios.

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