Robotic Scare-crow Used Image Processing

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Abstract — A Robotic scare-crow using image processing system for crops protection from the birds using sensor image processing. The Image processing and Robotic are important role in the project. When birds enter in the farm eating crops the robotic scare-crow will kept in the farm it is connected to the image processing system. The image processing System detect or sense the birds enter in the farm give command to the motor and motor is on. the robotic scare-crow moves left and right sides on the bases of the command and A loudspeaker also kept for the audio voice by which birds are fly away crops are protection and farmer get relaxed by using this project.

Keywords- Industrial identification;Bird detection; MATLAB Image processing.

I.   INTRODUCTION

Our domain is to detect birds in real time video with the help of web camera. In this with the help of 'Image Processing' the image of birds will detect. Here first of all we should know how 'Image Processing' works in real time video to detect the birds? The main of the system is to detect the birds if any in the every frame of the video on real time video streaming and when the same is detected the controller is triggered through the image processing system and thus informs the motor to turn on. The Robotic scare crow is based on the motor. When the birds enter in the farms the web camera is kept for real time video streaming which is display in our system. Our system will detect the birds in real time video which gives commands to the motor and motor will activate through which robotic scare moves thus birds fly away. The loudspeaker which is interface with system is work in synchronous with system with the help of the loudspeaker the birds will afraid by hearing the voice generate by the loudspeaker. we have used Image processing system to detect the birds easily in video streaming every frame of video to detect the image of birds which are programmed in system.
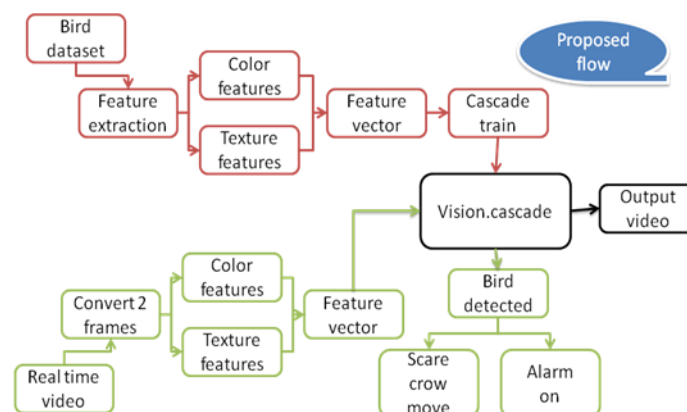
II.   BLOCK DIAGRAM

Fig 1: Block diagram

Description:

Real-time capture camera: In the initial condition whole setup is ready to perform through general camera video is continuously searching and streaming to the computer. We can take video from multiple source like CCTV, WEBCAM, live streaming videos from server etc.

Convert to frames: The Viola-Jones object detection frame work is the first object detection frame work to provide competitive object detection rates in real- time proposed in 2001by Paul viola and Michel Jones. Although it can be trained to detect a Varity of object classes, it was motivated primarily by the problem of face detection. This algorithm implemented in open CV. The characteristics of Viola-Jones algorithm which make it good detection algorithm are:

1. Robust- very high detection rate (true-positive rate) and very low false- positive rate always.
2. Real time – for practical application at least two frames per second must be processed.
3. Bird detection only (not recognition) - the goal is to distinguish faces from non faces.
4. At the computer unit video is converted into frames. Every frame is an image contains some information through MATLAB images processing is done over all frames. There are two types of feature color feature and texture feature, images contain these two features.

Bird detection: The system will be working on majority two blocks the one is training and the other is called testing. The main of the system is to detect the birds if any in the every frame of the video on real time video streaming and when the same is detected the controller is triggered through the image processing system and thus informs the motor to turn on. The motor is further equipped with the scare crow and hence the scarecrow moves and the loud speaker generates voice or audio signals that makes the birds fly away and thus protect our crops and increases the productivity. First of all we collect different data set of the birds and train them and make a data base of the same. The training procedure is carried out with the sate of art algorithm SVM: support vector machine. After the successful completion of the training of different birds the resultant vector will be saved with .mat file in the matlab. The vector or the trained vector is taken as a reference in the testing phase and are used to predict the presence of the birds and hence testing of the same .And hence in the above mentioned manner using image processing birds can be detected scarecrow could be initiated and the birds could be feared to fly and hence crops could be saved.

Bird point feature extraction: Through image processing colour and texture features is extracting and further testing finally capture frames (images) and training database are compared and predict the bird . At training duration several texture feature like big and small birds several birds and colour of same several birds are extracted and create database using extracted (bird) information.
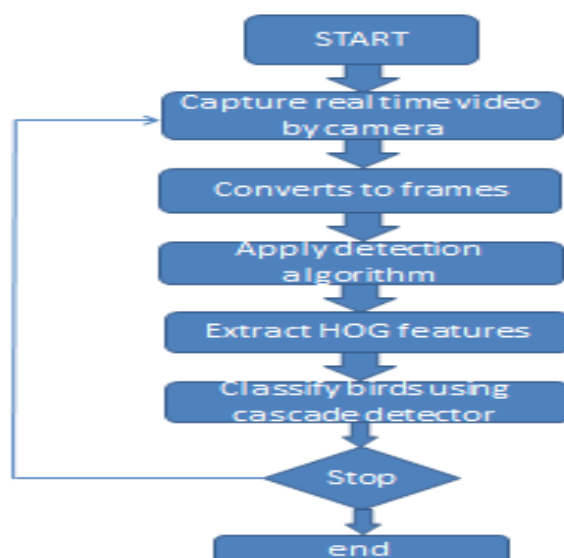
IV. FLOW CHART

Fig 2: Flow chart of algorithm

Description:

By a click on start icon on GUI [Graphical User Interface] MATLAB algorithm start fetching real time video files and converting that video file into frames. Every frame is an image contains some information. MATLAB images processing is done over all frames. The image contains two types of features, color feature and texture feature. The detected face portion

in video frames by MATLAB algorithm is cropped and different feature extraction method like HOG [Histogram of Oriented Gradients] and LBP [Local Binary Pattern] is applied over the cropped bird portion of image.

In machine learning, the cascade classifier consists of stages, where each stage is an ensemble of weak learners. The weak learners are simple classifiers called *decision stumps*. Each stage is trained using a technique called boosting. *Boosting* provides the ability to train a highly accurate classifier by taking a weighted average of the decisions made by the weak learners. Each stage of the classifier labels the region defined by the current location of the sliding window as either positive or negative. *Positive* indicates that an object was found and *negative* indicates no objects were found. If the label is negative, the classification of this region is complete, and the detector slides the window to the next location. If the label is positive, the classifier passes the region to the next stage. The detector reports an object found at the current window location when the final stage classifies the region as positive.
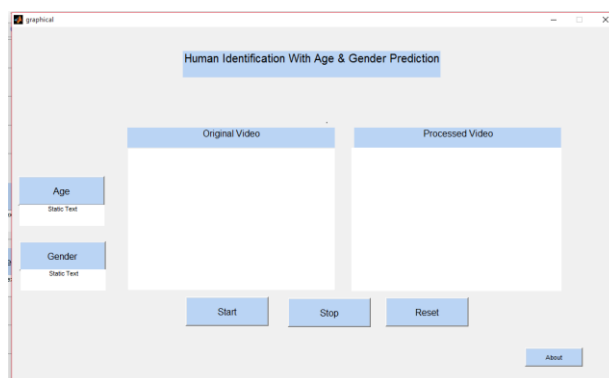
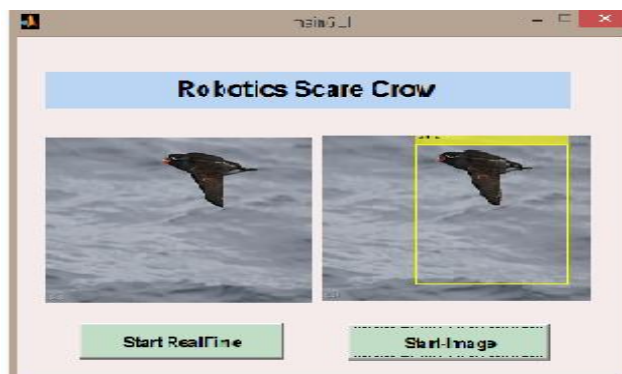## V.   SIMULATION RESULTS

Fig. 3: Graphical user Interface

Fig. 4: Graphical user Interface Detection

Description:

Graphical user interface (GUI) consists of two axel window, push buttons, static text windows. Axel window that are label with "original video" plays the original video which is directly stream form camera and the second axel window label with processed video plays processed video. In this window bird detection feature is visual. There are four push button respectively start, stop, reset and about. Start button initiate the program. Stop button provide interrupt function and reset button reset the program and back to the initial condition. BY pressing the about button, it shows the details of this GUI version. .

CONCLUSION:

Here we had modeled the 'Robotic Scare Crow using Image Processing' we can very much say that such low cost solution could be applied to the agriculture fields so as to avoid destruction of the crops as against birds and also increase the productivity and ultimately add to our national income.

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