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Face Detection By some Methods based on MATLAB

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ABSTRACT

Over the past few years, technology has begun to discover things rapidly growing, as this technology has come to dominate the vision of computers, which have taken an important role in monitoring cars and their safety.

In this work, the face detection and tracking process was highlighted,[6], and two algorithms were created to clarify the role of the MATLAB program in creating a simple system for facial tracking and detection where the first example shows the application of Algorithm1 using the CAMShift method where the face was tracked where the results were weak due to sufficient contrast between Face and background area, the algorithm1 was created to implement the method, [2].

Example2 is using the method Kanade Lucas Tomasi (KLT), which is a simple system where it is able to detect the face and track it where the system is able to detect the face when the head moves and tilts, with Estim Geometric Transform (EGT) function and Duration Geometric Transform (DGT). The algorithm 2 was created to implement the method.

The examples in this work show the implementation and efficiency of the mentioned algorithms

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1 . Introduction

Face detection technology took an important field using the computer that calculates facial features through taking an integrated image,[7-8], then an Ada Boost-based algorithm is created that identifies and produces highly effective compilations in which the image is highlighted and the background is ignored so that the accounts are focused on areas similar to the face by conducting experiments on the rules The data that the detector operates where 15 frames are taken per second without any difference in image or skin color. [1]

Neural networks have an important role in discovering the face, such as the color of the skin,[4], [5]. Where facial detection algorithms have been created that contain acceptable errors in the functions they used to train workbooks to detect the face, including Haar-Training, which helps obtain high rates through some operations on each pixel to obtain the

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integrated image In the second step, the role of AdaBoost comes in a sub-area of the image. A small number of important features will be specified so that all features are similar to Haar [3].

The training time of the neural network was reduced by using CNN in the Matlab program, as the last two layers are out of the four layers.

Through the Matlab image processing program using the CNN algorithm to evaluate an image of 40 people

Many computer vision applications rely on object detection and tracking, such as auto safety and activity monitoring,

In this work, the face detection and tracking process was highlighted, and two algorithms were created to clarify the role of the MATLAB program in creating a simple system for facial tracking and detection where the first example shows the application of Algorithm1 using the CAMShift method where the face was tracked where the results were weak due to sufficient contrast between Face and background area, the algorithm1 was created to implement the method.

figure2 is using the method Kanade Lucas Tomasi (KLT), which is a simple system where it is able to detect the face and track it where the system is able to detect the face when the head moves and tilts, with Estim Geometric Transform (EGT) function and Duration Geometric Transform (DGT), The algorithm 2 was created to implement the method

2. Use CAM Shift to detect face algorithm

In this section, an algorithm is used to track the face during the movement of the head and to avoid the problem of losing tracking information during movement

Algorithm 1 CAMShift with face detection

In put: Face To Track

Output: Specific face features

Step 1: The first step is to discover the video frame where the proposed detector is used to

detect the face, By tracking the face that the detector of successive objects in the video performs when the head moves, the tracking is lost to avoid this problem, the face will be fragmented for each frame in an intense account.

Step 2: Track features of the selected face, In this step, the face that is assisted by selecting a

feature, such as touch or color, is tracked, this feature remains constant even if the face is moved

Step 3: Track the Face, CAMShift histogram algorithm which the dependent tracker where

the tracing feature is determined is the skin color and by using a graph of the pixel values that are extracted in the Hue channel in the face for example the nose area using this graph is done through the successive video edges

Figure 1 shows the steps of the algorithm, which shows how to define and track the video as well, after designing a program for the steps of the algorithm in MATLAB program.



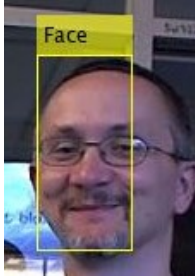
1. Detect Face	2. Hue Channel Data	3. Video Player
<p>4.</p> 	<p>5.</p> 	<p>6.</p> 
7. Step 1	8. Step 2	9. Step 3

Figure 1: The steps of the algorithm1 with CAM Shift

3 . Use KLT to detect face algorithm

In this section a method called KLT to detect the face automatically or automatically with its tracking in this theory is used feature points example 2 illustrates the method KLT where the completion of the method in the fullest way even when a person moves his head and tilts even if it is away from the camera and its direction Method steps illustrated by algorithm 2

Algorithm 2: Kanade Lucas Tomasi (KLT) with face detection

In put: Face To Track

Output: Specific face features

Step 1: In this step, the face is exposed where the face is determined with the video moving using the detection algorithm Viola-Jones (VJ) and is distinguished from other objects in the ocean.

Step 2: Sequentially detected objects that may fail to detect the face due to the tendency of the head while moving through the video frame

Step 3: By applying the algorithm KLT the face is determined using the feature points that are Shi and Thomas standard.

Step 4: Track the face by specifying its features

Step 5: This step reliably is done using a standard to identify good features that improve tracking.

Step 6: Track the points identified in step 4

Step 7: The vision. Point Tracker system is used to use each point from step 4 that tries to track down and find each point corresponding to the point identified.

Step 8: Estim Geometric Transform (EGT) function for expansion, rotation, as it is measured between the old and new points that this process concentrates within the box frame around the face.

Step 9: Display the results through the video player after its configuration, Display video frames by creating a video player object.

Step 10: Using the Duration Geometric Transform (DGT) function, the face is tracked at this point. The role of the points identified in the previous steps follows, the tracking of these points to determine the movement of the face.

Step 10: Engineering transformation is calculated after taking a copy of the points that were identified between the points in the old and current framework.

End

Figure2 shows the algorithm 2 where a system was used to track the face where this system detects the face and tracks it automatically and through video and moving the head where this method proved its ability to discover the face even when the head is tilted and this system was organized through a program developed using the MATLAB program, the steps of algorithm 2 illustrated in Figure2

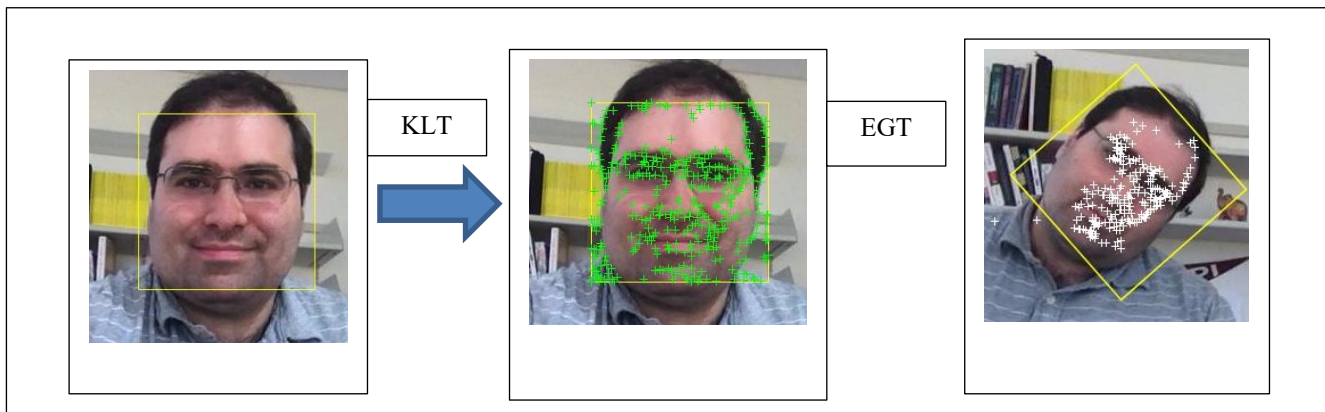


Figure2: It shows the steps of the algorithm in defining the face using the method

4. Live video acquisition with face tracking and detection

Figure 3 represents how face is detected during video playback, The example develops a face tracking system where the image is captured during video streaming and through the MATLAB program the web camera is supported to support the devices so that you need to download and install to quit the example and run it, This This example differs from the previous two examples where the system that implements this example depends on one of two modes: detection or tracking

The Cascade Object Detector (COD) is used to detect and initialize the Vision Point Tracker (VPT), after which it switches to Tracking. The boundaries of the video are obtained and displayed after objects are created in order for faces to be exposed and points tracked, Figure 3 shows the process of detection and tracking using the webcam. The video frame is captured and processed, for example, the loop with the number 400 is played, or until the video player window is closed.

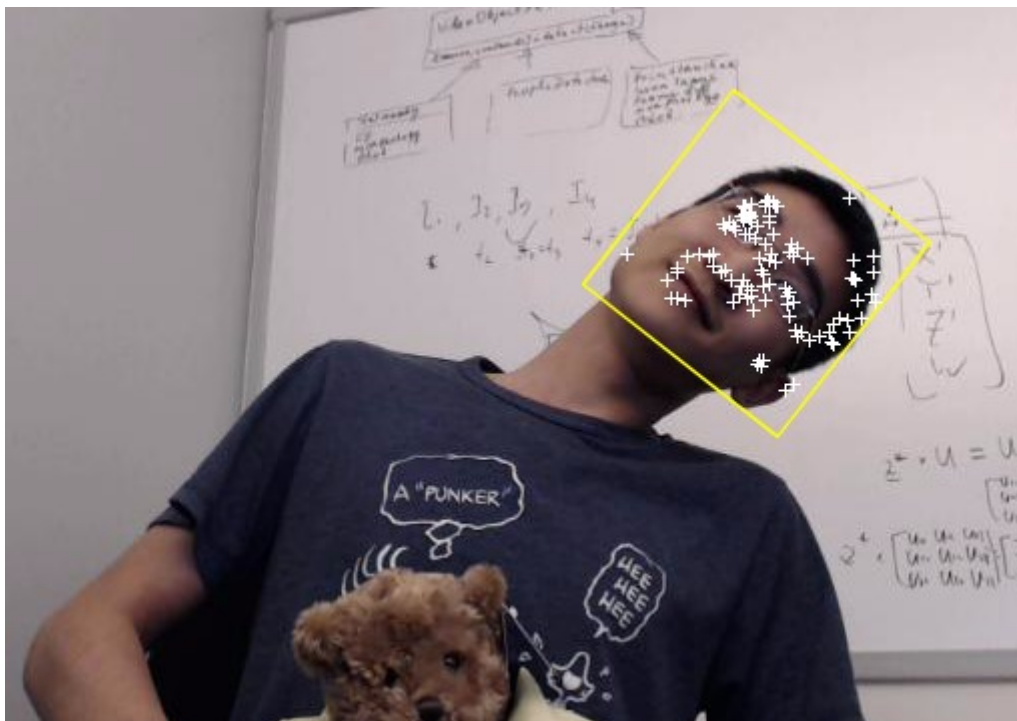


Figure3: Live video acquisition with face tracking and detection

5. Results and Discussion

The importance of the research lies in discovering ways to detect the face using the Matlab program, where the method used was programmed and to obtain good results to control face detection during movement, while in previous works the face was detected without movement, this is what distinguishes this work and using the Matlab program.

In [2] the mathematical equations were used to reveal the face, and a result was reached without a video movement. In this work, the result was reached faster by using Matlab programs, which was represented by the algorithm 1 and 2.

6. Conclusion

In this work three methods were created that were strengthened in three samples where the first sample represented the first method was to create a system by which the face is tracked and through the operation of the video the result of the tracking was weak.

The third figures represents face tracking directly, which indicates the speed of completion of the process by creating objects to track facial detection points during video playback and face movement.

In this paper, a facial tracking system was developed with the help of the MATLAB program to support the webcam with some support devices so that it can be installed and loaded so that it can be activated to run the figure3

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