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A Review on Human Action Recognisation Using SVM Classifier

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ABSTRACT

The Research work Human activity recognisation district of interest a portion of video with mixture method and upgrade of Non –region of interest part is examined in this work. As of late, programmed human movement acknowledgment has attracted much consideration the field of video examination innovation because of the developing requests from numerous applications, for example, reconnaissance situations, amusement situations and medicinal services frameworks. In an observation domain, the programmed recognition of anomalous exercises can be utilized to alarm the related power of potential criminal or risky practices, for example, programmed reporting of a man with a sack dallying at an airplane terminal or station. There are SVM and KNN is studied to segment the human action on MAD dataset and accuracy is calculated on this dataset after the action recognisation.
Keywords : ROI, Non-ROI, 2D/3D, Human Action.

I. INTRODUCTION

In today's life style Computer is a very essential and important machine. Manually work done by people is now done by Computer in very less time, efficient and with more accuracy. With the fast pace of development in the field of human computer interaction, human and its activities also need a broader study in order to develop more human-computer friendly systems. Human actions are not merely due to the movement or motion of body-parts of a human-being, rather it is the depiction of one's intentions, behavior and thoughts. "Action Recognition" as the term itself is self-suggesting, it is the recognition of an activity or action by using a system that analyzes the video data to learn about the actions performed and uses that acquired knowledge to further identify the similar actions. Recognizing human actions and activities is a key-component in various computer applications like video-surveillance, healthcare systems, recognition of gestures, analysis of sports events and entertainment events. In a Video Surveillance environment, the detection of various unusual or abnormal actions in a video sent to court for criminal investigation [3]. Likewise, in a healthcare environment, 'patient monitoring', the process of automatic recognition of a coma patient's actions can help the concerned doctors to check out the patient's recovery status by evaluating his captured video archives.

II. METHODS AND MATERIAL

A. Research Motivation

Although, various efforts have been done by many researchers in human actions recognition, by using different techniques, methodologies, using different classifiers etc., even then there are various challenges present till date to completely identify the human activities [challenges].Complex actions, varying viewpoints of the camera alignment, occlusion are some of the major problems faced by the recognition systems[5]. This thesis tries to address one of the greatest unsolved problems of computer vision from earlier times which is the problem of understanding "what people are doing". A fair solution to this problem opens up tremendous application possibilities, ranging from medical issues to entertainment industry and also works well for security issues. While choosing our scenario to work, we try to comply with the requirements of the ongoing research trends in the area of action recognition community and the real-world activities [4].

B. Levels of Video Understanding

With the increase in the demand of video data applications, every researcher has his own well-defined schematic way to work upon the video datasets in order to meet different kind of objectives as per his/her requirements. In simple words, we can classify the video understanding in three levels as given below in figure 1.1.

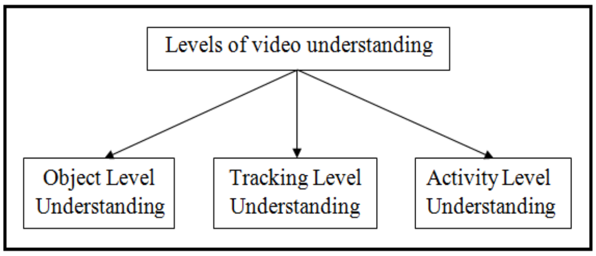


Figure 1.1: Levels of video Understanding [3]

- Object-level understanding: In this level, we identify locations of persons and objects present in the available videos, e.g. 'Car' or 'bus' in the video.
- Tracking-level understanding: In this level, we locate a moving object or multiple objects over time using a camera, e.g. traffic tracking, animal migration tracking systems.
- Activity-level understanding: In contrast to the above levels, the working on basis of activity recognition is different. In this level, recognition of human activities and events is done e.g. recognizing a sports action, walking style, dancing style etc. The next sub-section will elaborate the working of human actions/activities recognition.

C. Human Action Recognition

Human actions are not merely due to the movement or motion of body-parts of a human being; rather it is the depiction of one's intentions, behavior and thoughts. "Action Recognition" as the term itself is self-suggesting, it is the recognition of an activity or action by using a system that analyzes the video data to learn about the actions performed and uses that acquired knowledge to further identify the similar actions. Human action recognition has been an attractive and popular research topic in recent two decades. Most previous works in this topic employed a frame-by-frame comparison to trained action models for classifying a newly arrived video sequence, which is computationally expensive due to the following facts:

- The consecutive frames in a video are correlated/ similar in temporal domain; hence it is redundant to compare every frame for classification.
- In some cases, only a few frames in a video are sufficient for discrimination of basic actions [1].

Activity recognition aims to recognize the actions and goals of one or more agents from a series of observations on the agents' actions and the environmental conditions., This research field has captured the attention of several communities due to its strength in providing personalized support for many different applications and its connection to many different fields of study such as medicine, human-computer interaction, or sociology.To understand activity recognition better, consider the following scenario. An elderly man wakes up at dawn in his small studio apartment, where he stays alone. He lights the stove to make a pot of tea, switches on the toaster oven, and takes some bread and jelly from the cupboard[5]. After he takes his morning medication, a computer-generated voice gently reminds him to turn off the toaster. Later that day, his daughter accesses a secure website where she scans a check-list, which was created by a sensor network in her father's apartment. She finds that her father is eating normally, taking his medicine on schedule, and continuing to manage his daily life on his own. That information puts her mind at ease.Many different applications have been studied by researchers in activity recognition; examples include assisting the sick and disabled. For example, Pollack et al.[1] show that by automatically monitoring human activities, home-based rehabilitation can be provided for people suffering from traumatic brain injuries. One can find applications ranging from security-related applications. Due to its many-faceted nature, different fields may refer to activity recognition as plan recognition, goal recognition, intent recognition, behavior recognition, location estimation and location-based services.

D. Literature Survey

This includes the literature of the research work that I have to implement in my research work. The different research papers of different researchers are studied that is given below:

Haoran Wang et.al [2014] have proposed utilizing abnormal state activity units to speak to human activities in recordings and, in view of such units, a novel inadequate model is produced for human activity acknowledgment. There are three interconnected segments in our methodology. To begin with, we propose another connection mindful spatial fleeting descriptor, named privately weighted word setting, to enhance the discriminability of the generally utilized neighborhood spatial-worldly descriptors. Second, from the insights of the setting mindful descriptors, we learn activity units utilizing the chart regularized nonnegative grid factorization, which prompts a section based representation and encodes the geometrical data. These units successfully connect the semantic crevice in real life acknowledgment. Third, we propose an inadequate model in view of a joint l2,1-standard to protect the delegate things and smother clamor in the activity units. Naturally, when taking in the word reference for activity representation, the meager model catches the way that activities from the same class offer comparative units. The proposed methodology is assessed on a few openly accessible information sets.[1]

Raviteja Vemulapalli et.al [2014] has proposed recently introduced cost-effective depth sensors coupled with the real-time skeleton estimation algorithm have generated a renewed interest in skeleton-based human action recognition. Most of the existing skeleton-based approaches use either the joint locations or the joint angles to represent a human skeleton. In this paper, we propose a new skeletal representation that explicitly models the 3D geometric relationships between various body parts using rotations and translations in 3D space. Since 3D rigid body motions are members of the special Euclidean group SE(3), the proposed skeletal representation lies in the Lie group SE(3)X………X SE(3), which is a curved manifold.[2]

Muhammad Shahzad Cheema et. al [2014] have studied methods are distinguished by naive but efficient feature extraction, sparse coding, instance-based learning and latent factor analysis. In particular, we (a) devise an efficient discriminative key poses approach for action recognition in videos that is independent of temporal context (b) present an efficient and scalable nearest affine hull method to HDLSS activity classification based on least squares optimization and QR-factorization (c) present a hierarchical bilinear factorization approach of style and content separation to recognize actions and actors in 3D data (depth, motion capture, motion history volumes) and (d) propose a non-negative matrix factorization based approach to determine action signatures from videos that are later used as saliency maps for classification of images.[3]

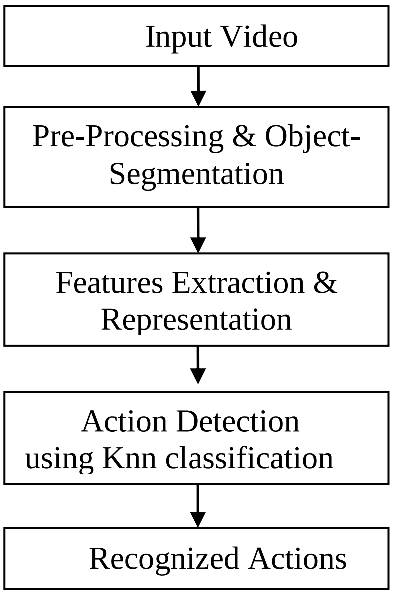
Shian-Ru Ke et. al [2013] have surveys extensively the current progresses made toward video-based human activity recognition. Three aspects for human activity recognition are addressed including core technology, human activity recognition systems, and applications from low-level to high-level representation. In the core technology, three critical processing stages are thoroughly discussed mainly: human object segmentation, feature extraction and representation, activity detection and classification algorithms. In the human activity recognition systems, three main types are mentioned, including single person activity recognition, multiple people interaction and crowd behavior, and abnormal activity recognition. Finally the domains of applications are discussed in detail, specifically, on surveillance environments, entertainment environments and healthcare systems. Our survey, which aims to provide a comprehensive state-of-the-art review of the field, also addresses several challenges associated with these systems and applications.[4]

E. Problem Definition

In the human action recognized research work different problems are studied from the review of different researchers. There are different problems that the previous work is only for 2D/3D pose estimation of the human body modeling. Another human activity of great interest to many researchers due to the fact that the loss of ability to walk correctly can be caused by a serious health problem, such as pain, injury, paralysis, muscle damage, or even mental problems. In the action recognized system It is Difficult to identify the side view of the person with some cameras, we can only identify the front and back side of the in a video. Another problem is that there is sparse decoding data loss problem due to ROI and NOI-ROI region of the action detected video.

III. RESULTS AND DISCUSSION

This research work is to implement the theft security system based on face reorganization. It is based upon GUI (graphical user interface) in MATLAB. It is an effort to further grasp the fundamentals of MATLAB and validate it as a powerful application tool. There are basically different files. Each of them consists of m-file and figure file. These are the programmable files containing the information about the images. We proposed a framework for human action detection in a video. The video data set that we have to test and train and find the region of interest and Non-ROI part of the video and after that process the ROI part to detect the action of the human with SVM and K-NN classification and enhance the Non –ROI part of the video. Find the accuracy of the detected part.



IV. CONCLUSION

In this paper I have studied different authors research papers related to human action segmentation. I also have founded some problems that is given in the problem definition. In this paper human action is recognized by CMU-MAD dataset. In this work, different classification techniques for human actions or activities recognition have been discussed. Each technique is better suited than the other for different types of activities in different application areas. On an average SVM performs better classification when we need a linear classification but the size of data is quite large. KNN, as discussed provides higher level of abstraction with high accuracies but time and complexity increases as compared to SVM that is implemented in future work.

V. REFERENCES

[1] Haoran Wang et.al "Action Recognition Using Nonnegative Action Component Representation and Sparse Basis Selection" IEEE transactions on image processing, vol. 23, no. 2, February 2014.

[2] Raviteja Vemulapalli et.al "Human Action Recognition by Representing 3D Skeletons as Points in a Lie Group" IEEE -2014.

[3] Muhammad Shahzad Cheema et. al "Efficient Human Activity Recognition in Large Image and Video Databases"2014.

[4] Shian-Ru Ke et. al " A Review on Video-Based Human Activity Recognition" computers ,ISSN 2073-431X, www.mdpi.com/journal/computers Computers 2013.

[5] Duong et.al " Activity Recognition and Abnormality Detection with the Switching Hidden Semi-Markov Model" . In Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), San Diego, CA, USA, 20–25 June 2005.

[6] Gorelick et.al " Actions as Space-time Shapes"In Proceedings of the Tenth IEEE International Conference on Computer Vision (ICCV), Beijing, China, 17–21 October 2005.

[7] Sukthankar et.al "Spatio-temporal Shape and Flow Correlation for Action Recognition"In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Minneapolis, MN, USA, 17–22 June 2007.

[8] Yamato et.al " Recognizing Human Action in Time-sequential Images using Hidden Markov Model" In Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Champaign, IL, USA, 15–18 June 1992.

[9] W. Brendel et. al. "Activities as time series of human postures," in Proc. ECCV, 2010.

[10] Q. V. Le et. al "Learning hierarchical invariant spatio-temporal features for action recognition with independent subspace analysis," in Proc. IEEE Int. Conf. Comput. Vis. Pattern Recognit., Jun. 2011 .