Volume 4, Issue 3, March 2014 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Review on Object Tracking Based on Shot Clustering and Joint Colour Texture Histogram Method

Uday A. Isasare,
Dept. of Electronics & Telecommunication
G. H. Raisoni C. O. E. & M., Amravati
Maharashtra, India

Prof. Archana O. Vyas
Dept. of Electronics & Telecommunication
G. H. Raisoni C.O. E. & M., Amravati
Maharashtra, India

Abstract: Object tracking is the process of locating a moving object over time in video. It has a variety of uses, some of which are: human-computer interaction, security and surveillance, traffic management and video editing. Video tracking can be a time consuming process due to the amount of data that is contained in video. As an Addition of it further to the complexity is the possible need to use object recognition techniques for tracking. The proposed method will improve greatly the tracking accuracy and efficiency. An object tracking algorithm is proposed to be presented by using the joint color texture histogram to represent a target.

Keywords: Human-computer interaction, Security, Objects tracking, Joint color Texture, Histogram.

I. INTRODUCTION

Object tracking has importance in real time environment because it plays an important role in several applications such as ***Security and surveillance*** to identify suspicious activity of peoples in mob, providing better sense of security using available visual information, In ***Medical therapy*** to improve the quality of life for physically handicapped patients, In banking industries to analyze behaviour of customers in bank during transactions, Traffic management on metro cities to analyze flow of traffic, and reductions of accidents. Video scene segmentation provides the most efficient solution so far. However, to proceed with scene segmentation, we will first apply low level segmentation of the video [4]. In various tracking algorithms used by different authors, mean shift tracking algorithms become popular because of their simplicity and efficiency. Furthermore, mean shift is a low complexity algorithm, which provides reliable solution for object tracking. Video is made up of number of capture moments that smallest part of video is called as shots, which is sequence of frames recorded by same camera. The visual content of video can be distributed by one or multiple frames, called key-frames. The number of key-frames we cannot determine previously because due to content variation it may be different for each shot [1]. Currently, it is found that a most of target representation algorithms are on the basis of object color, where which could be viewed as the discrete probability density function (PDF) of the target area. Color histogram is an efficient part of point sample distribution and is very proper in representing the dedicated object appearance. The background color patterns, which may be same for both object and foreground texture of the object, are the important features plays role to represent and recognize objects. Since background color pattern place new information that the object color histogram does not provide, using the joint color-texture histogram for target representation is simplest than using only color histogram or only texture histogram in targeted object tracking.

The proposed target representation scheme will eliminates similar color texture of background and reduces noise in the tracking process. Proceeding further towards the goal of object tracking and retrieval requires the grouping of shots into scenes. A scene can be called as a simultaneous series of semantically correlated shots of same video. The term scene usually refers to as a group of shots taken in the same physical location describing objects. A more accurate representation of a video could be the merging of scenes into some logical story units that corresponds to chapters describing the different subthemes of a movie.

Several approaches have been used by different authors for the scene segmentation and Object Tracking in the frames problem. Proposed work transforms this task into a color-texture problem of targeted object. A shot similarity graph proposed to be constructed, where each node represents a shot and the edges between shots will show their similarity based on color and motion information. Then the normalized cuts method proposed to be applying to partition this graph. In the method proposed for detecting boundaries of the logical story units by linking similar shots to each other and connecting overlapping links. For each shot, all key frames will cascade into a larger image and the similarity between shots will be computed by comparing these shot images. A scene transition graph proposed to be constructed to represent the video and the connectivity between shots. Then, this transition graph will be divided into connected sub graphs representing the scenes.

II. LITERATURE REVIEW & RELATED WORK

To achieve the objective, the surveyed literature is as mentioned.

Vasileios T. Chasanis, Aristidis C. Likas, and Nikolaos P. Galatsanos, proposed an algorithm in the area of video indexing, which require the efficient segmentation of video into scenes. They use typical scene detection algorithms [1].

Yun Zhai, *Student* and Mubarak Shah, proposed the videos, Consist of many consecutive shots that are captured by different camera operations, e.g., on/off operations and switching between cameras [2].

Jiafu Jiang And Hui Xiongin, Proposed Traditional color histogram Mean-shift (MS)algorithm & had considered only object's color statistical information, and didn't contain object's space information, so when the targeted object's color distribution was similar to the background texture, the traditional algorithms easily caused object tracking get inaccurate result or lost [3].

III. PROBLEM IN EXISTING METHODOLOGY

Color is a powerful feature for object tracking, using only color features is sufficient for most tracking tasks, However problems arise when the targeted object and background have similar color distribution.

That time it may be difficult to distinguish the object from background. So during object tracking we may get inaccurate result. As an improvement in above designed methodology our approach is mainly too focused on both color and background texture. Existing methods use temporal distance between shots in the definition of the similarity matrix that is subsequently used as input to the clustering procedure. Joint color texture histogram is decided to use to solve the difficulty of object color close to background color.

IV. PROPOSED WORK

***A. Image segmentation*:** The frames that we will extract from the available video that we will have are segmented first, then features of each object in the segmented image will extract, after that pattern matching is done on the simultaneously moving frames having the desired features in hand, the motion vectors will calculate and mask will moved accordingly.

B. Types of shots: Important thing with any video is that it is made up of number of combinations of shots *(The consecutive frames from the beginning to the end of recording in a camera are called shot [9].).* Combining shots together will form a different scene and different scenes together form a total video. Shot shows a continuous action in an image sequence *(i.e. Frames).*

C. Key Frame Extraction: For finding a KEY frame from video, first we will take frame of each shot as reference frame and all other frames within shots are general frames. After that we will compute the difference between all the general frames and reference frame in each shot with proposed algorithm. Then search for the maximum difference within a shot by using relation:

$$\text{Max (i)} = \{D_f(1, k)\},\ k= 2, 3 \ldots N.$$

Now if the Max (i) > MD, then the frame with the maximum difference is called a key frame and otherwise with respect to the odd number of a shot's frames, the frame in the middle of shot is chose as key frame; in the case of the even number, any one frame between the two frames in the middle of shot can be chose as key frame [10].

V. METHODOLOGY

The main steps of our method can be depicted by the diagram as shown below.

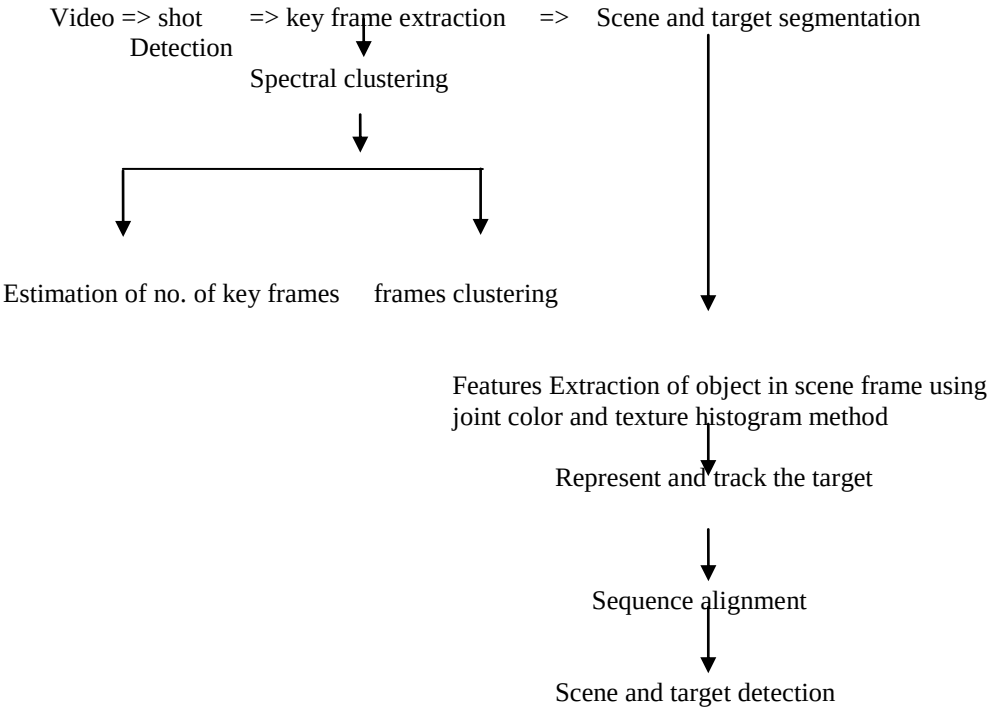

Fig. 1. Flow Chart of Complete System

VI. CONCLUSION AND FUTURE WORK

This paper gives an idea about the basic methods of moving object tracking in a video. It is somehow possible to give accurate result but problem arises when the target object and background have similar color distribution. It may be difficult to distinguish the object from background. So our future research on this topic is to implement a new method for object tracking, so that this problem will be eliminated.

ACKNOWLEDGMENT

The author sincerely thanks to Prof. Archana O. Vyas, Assistant Professor, G.H.R.C.E.M, Amravati, Dr. P. V. Ingole, Principal, G.H.R.C.E.M, Amravati and Prof. N. N. Mandaogade, Head of E & TC Department G.H.R.C.E.M, Amravati for valuable suggestion, criticism and time to time encouragement.

REFERENCES

[1] Vasileios T. Chasanis, Aristidis C. Likas, and Nikolaos P. Galatsanos "Scene Detection in Videos Using Shot Clustering and Sequence Alignment," *IEEE Transactions on Multimedia*, Vol. 11, No. 1, January 2009, pp.89-100.

[2] Zulfiqar Hasan Khan, Irene Yu-Hua Gu and Andrew G. Backhouse "Robust Visual Object Tracking Using Multi-Mode Anisotropic Mean Shift And Particle Filters," *IEEE Transactions On Circuits And Systems For Video Technology*, Vol. 21, No. 1, January 2011, pp.74-87.

[3] Huijing Zhao, Jie Sha, Yipu Zhao, Junqiang Xi, Jinshi Cui, Hongbin Zha, and Ryosuke Shibasaki. "Detection and Tracking of Moving Objects at Intersections Using a Network of Laser Scanners," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 13, No. 2, June 2012, pp. 655-670.

[4] Liyuan Li, Shuicheng Yan, Xinguo Yu, Yeow Kee Tan,and Haizhou Li "Robust Multiperson Detection and Tracking for Mobile Service and Social Robots," *IEEE Transactions On Systems, Man, And Cybernetics—Part B: Cybernetics, Vol. 42, No. 5, October 2012*,pp.1398-1412.

[5] Hidetomo Sakaino, "Video based Tracking, Learning, And Recogni-tion Method For Multiple Moving Objects," *IEEE Transactions On Circuits And Systems For Video Technology, Vol. X, No. Y, Z 2013.*

[6] Y. Zhuang, Y. Rui, T. S. Huang, and S. Mehrotra, "Adaptive key frame extraction using unsupervised clustering," in Proc. IEEE Int. Conf. on Image Processing, 1998, pp. 866–870.

[7] Wallapak Tavanapong and Junyu Zhou, "Shot Clustering Techniques for Story Browsing," *IEEE Trans.On Multimedia*, Vol. 6, No. 4, August 2004,pp.517-527.

[8] Dr. Sunitha Abburu,"Semantic Segmentation and Event Detection in Sports Video using Rule Based Approach," *IJCSNS International Journal of Computer Science and Network Security*, VOL.10 No.10, October 2010,pp.35-40.

[9] Seung-Hoon Han, Kuk-Jin Yoon, and In So Kweon, 2000. A new technique for shot detection and key frames selection in histogram space. Workshop on Image Processing and Image Understanding, pp 475-479.

[10] Naimish Thakar,Upesh Patel, Pradip Panchal and Hitesh Panchal " Shot Boundary Detection and Key Frame Extraction from Uncompressed Video Stream", International Conference of Signals, Systems and Automat ion, ICSSA-2011, ISBN 978-1-6123-3002-0.

[11] T. M. Cover and J. A. Thomas. Elements of Information Theory.John Wiley and Sons, New York, 1991.

[12] A. Papoulis. Probability, Random Variables, and Stochastic Processes. New York: McGraw-Hill, Inc., 1991.

AUTHORS PROFILE

Uday A. Isasare Received B.E. degree in Electronics from M.I.E.T., Gondia, RSTM Nagpur University, Nagpur Maharashtra, India. Presently he is pursuing M.E. degree in Electronics and Telecommunication at G.H.R.C.E.M. Sant Gadage Baba Amravati University, Amravti, Maharashtra (India), During 2011-2012 he has worked as Lecturer at Jagadhambha College of engineering & Technology, Yavatmal, (MS) India.

Prof. Archana O. Vyas Received M.Tech degree in Electronic System and Communications Engineering form Government College of Engineering, Amravati, Maharashtra, India. Presently she is working as Assistant Professor in Electronics and Telecommunication engineering dept. at G.H.R.C.E.M., S.G.B. Amravati University, Amravti, Maharashtra (India).

