

A REVIEW ON OBJECT DETECTION & TRACKING BY USING VARIOUS ALGORITHMS

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ABSTRACT

The moving object detection is a prerequisite and difficult point to realize tracking in the video tracking system. In order to detect moving object effectively, an object tracking algorithm is proposed based on combination of dynamic template matching and Kalman filter. First, get the area of the moving object by using inter-frame difference method and extract the SIFT feature points. Then, find the location of the candidate object that is most matched with the object template in the search area by Kalman filter and match it with the object template in the current frame. Finally, the feature points' loss rate will serve as the limited threshold, and we update template according to dynamic template updating strategy. By the number of the frames of the targets matching failures we determine whether the moving target is disappeared. Several experiments of the object tracking show that the approach is accurate and fast, and it has a better robust performance during the attitude changing, the size changing and the shelter instance.

Keyword :- Object identification, Noise reduction, and Video surveillance

1. INTRODUCTION

1.1 Data Mining

Data mining^[1] is the process which finds valuable patterns from large amount of data, the process of extracting previously unknown, understandable and precious information from large databases. The progress of information technology has generated huge amount of databases and huge data in various areas. The research in databases and information technology has specified increase to an approach to store and manipulate this valuable data for further decision making. Data mining is a process of extraction of useful information and patterns from large data. It is also called as knowledge discovery process (KDD), information mining from data, knowledge discovery or data /pattern examination.

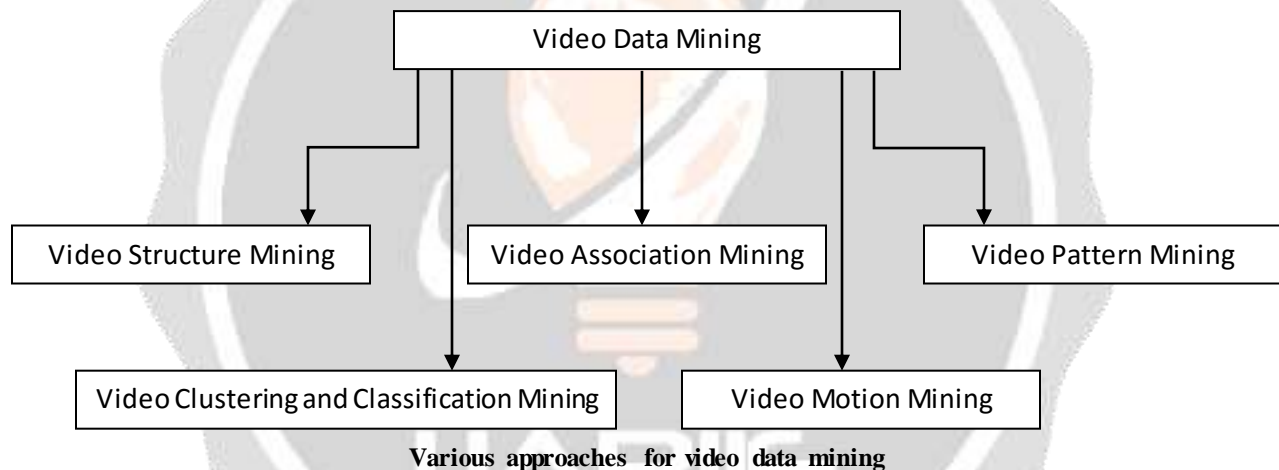
Data mining is known as one of the core processes of Knowledge Discovery in Database (KDD). It is the process that results in the discovery of new patterns in large data sets. It is a useful method at the intersection of artificial intelligence, machine learning, statistics, and database systems. It is the principle of picking out relevant information from data. It is usually used by business intelligence organizations, and financial analysts, to extract useful information from large data sets or databases. Data mining is use to derive patterns and trends that exist in data. There are a number of data mining techniques^[2] have been developed and used in data mining projects recently including association, classification, clustering, prediction and sequential patterns etc., are used for knowledge extraction from databases.

Data Mining Tasks:



1.2 Video Data Mining

A process of finding correlations and patterns previously unknown from large video databases. The main objective of video mining is to extract the significant objects, characters and scenes by determining their frequency of re-occurrence^[3].



A. Video Structure Mining

Video structure mining is the process which is used to identify the objects in the video.

B. Video Clustering and Classification

Video clustering and classification is the process which is used for the cluster and classified the various types of video to improve their brows ability of video.

C. Video Association Mining

Video association mining is the process which is used for show the association between the video.

D. Video Motion Mining

Video motion mining is the process which is used for the find the various motions from video and identify useful events.

E. Video Pattern Mining

Video pattern mining is the process which is used for the finding the pattern from the video and those pattern are useful for the finding the same pattern in the other video such as the same event.

Video is the an example of the multimedia types data as it contains different types of data such as audio, image, text, meta-data and its mostly use in many potential applications like medicine, education, programs, sports, security, surveillance.

2. PROBLEM STATEMENT

Kalman filter require a lot of time and need to improve performance because it is based on wide sense stationary signals. So it don't vary with time and video is related to time. Kalman filter is independent of time. It is based on two dimensional signal, not direct on object state. So it require a accurate tracking technique for video object. Prediction of object in video is not efficient by using kalman filter.

2.1 Various Techniques for Object Detection & Tracking by using Wiener filter

First we take a one video and initialize a track of video. Video is a sequence of frames and all the frames of video are analyze until last frame of video. All the frames of video are filter by using wiener filter. First one frame's object is tracked and then another frame.

Considering we need to design a wiener filter in frequency domain as $W(u,v)$.

Restored image will be given as

$$X_n(u,v) = W(u,v).Y(u,v)$$

Where $Y(u,v)$ is the received signal and $X_n(u,v)$ is the restored image. we consider a large set of images and calculate the power spectrum for them and find a mean, that could then be used as the power spectrum input for the wiener filter, we are likely to get better results.

$$S_n(u,v) = |N(u,v)|^2 \text{ power spectrum of noise}$$

$$S_f(u,v) = |F(u,v)|^2 \text{ power spectrum of undegraded image}$$

It find the centroid of object. It is important to have a large data set, to calculate power spectrum for. Wiener filter is an excellent filter when it comes to noise reduction or deblurring of images. After finding centroid of object, all the object are tracked with square line and this procedure is repeated to all the frames of video. Finally all the moving object are tracked from video till last frame of video.

Examples: We apply the filter to the following set of images.



1. Obtained from ^[5]



2. Obtained from ^[5]

We reduce the noise variance (noise power):



3. Obtained from ^[5]



4. Obtained from ^[5]

We decrease the noise variance even further.



5. Obtained from ^[5]



6. Obtained from ^[5]

As We Can see A Wiener filter does a very good job at deblurring of an image and reducing the noise.

3. CONCLUSIONS

Wiener filter is an excellent filter when it comes to noise reduction or deblurring of images. A user can test the performance of a wiener filter for different parameters to get the desired results. It considers both the degradation function and noise as part of analysis of an image. By using wiener filter, object is detected and tracked from video. So we can identify video's object and it is very efficient then kalman filter algorithm. All moving object of video are tracked until complete video.

4. REFERENCES

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BIOGRAPHIES



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